

## Inside Dope

By GEORGE  
F. TAUBENECK



Learn to live and laugh —  
thus delay your epitaph

**Stories of the Week**  
**Gags of the Week**  
**Sputnik, Nutsnik—**  
**We Have ION Power**  
**Refrigerated Space Ships**  
**Last Laughs**  
**Add Definitions**

### Stories of the Week

From Africa word comes that natives have developed a new form of intoxication. They inhale gasoline exhaust fumes from cars and tractors.

Have we of the 1958-model Congested Continent built up a certain immunity to such fumes?

Or may we, perhaps, anticipate even wilder shenanigans from exhilarated Sunday drivers of the future?

Anne Wheaton is the first woman to be appointed Associate Press Secretary for the White House. Her boss, Jim Hagerty, couldn't attend the party thrown for her by Washington's press corps. Instead he sent this note:

"It will be nice to have an associate that I can kiss now and then." Her predecessor, Murray Snyder, never seemed to get used to it.

There are those who love it, but to most people the Old State-War-Navy Building in Washington is an ornate eyesore.

Upon its completion President Grant was informed that it was fireproof.

"That's a pity," grunted U. S. Grant.

"Pictures of my grandson were on the front pages of newspapers when he was only three days old," observed Harry Truman.

"It took me," added the former President, "50 years to make it."

### Gags of the Week

"He gets his exercise stretching the truth," we overheard from an adjacent luncheon table.

"She couldn't be two-faced," kittied Lura, "or she wouldn't be wearing that one."

One of the interesting experiences of a lengthening life is to see so many of the old mistakes being introduced as new discoveries.—S F C Spotlight.

### Sputnik, Nutsnik—

**We Have ION Power**

So you think the Russians are far ahead of us with their  
(Concluded on Page 5, Col. 1)

## Frigidaire Refines Sheer Look for '58

### Has 3 'Slim, Vertical' Room Air Conditioners

DAYTON — Subtle refinements in its "sheer look" styling plus a wide variety of new convenience features marks the Frigidaire 1958 line of refrigerators, food freezers, and electric ranges.

Frigidaire's 1958 room air conditioner line will include three new slim, vertical models with sheer look styling, which can be mounted in double-hung windows, casement windows, or through the wall.

Other Frigidaire air conditioning equipment for residential and larger installations will be introduced at a later date.

Frigidaire stylists have given the popular sheer look, which it initiated last year, a new aesthetic feminine touch, putting more emphasis on the slim, trim, uncluttered styling lines.

Two new colors have been  
(Concluded on Page 8, Col. 1)

## York To Detail New Products In Added Lines

YORK, Pa. — York Div. of Borg-Warner Corp., which has just entered the automotive air conditioning field, soon will announce a number of other new products which represent York's entry into "large potential markets in which the company has not previously been involved," according to Henry Haase, president.

Haase said several new products are reaching the final  
(Concluded on Back Page, Col. 5)

### 10th Exposition Air Conditioning Preview Issue

For special PREVIEW BRIEFS of what air conditioning exhibitors will show at Chicago, see pages 10, 11, 12, 13, and 23. Exclusive analysis on 1957 AIR CONDITIONING SALES and amazingly candid probe of WHAT'S HOLDING BACK RESIDENTIAL SALES start on this page. Regular HEATING SECTION appears on pages 28 and 29. NEXT WEEK, we preview parts and supplies exhibits. Nov. 18—Big Show Issue.

## Two Heat Pumps, Dehumidifier Lead Gibson '58 Lines

NEW ORLEANS—Two new products — a "Thermomatic" heat pump in 2 and 3½ hp. capacities and a dehumidifier with an exclusive overflow cut-off feature—have been added to the Gibson Refrigerator Co.'s product lines for 1958.

They were introduced to more than 500 distributors attending the Gibson International Sales Mardi Gras here. The distributors saw Gibson's 1958 self-contained central air conditioners, room air conditioners, refrigerators, and freezers.

The all-new 1958 line is a result of a multi-million dollar tooling program designed to give Gibson "Trimline" products the look of built-in appliances. W. C. Conley, vice president in charge of Gibson sales, told the convention.

Conley also announced that for the first time, prices at the retail level will be set by local distributors. While price comparisons are difficult between 1957 and 1958 lines because of the many changes, Conley stated, "Where we can compare model for model, the increase will average 2 to 3%."

The self-contained central air conditioner line consists of two models duplicating the Thermo-  
(Concluded on Page 30, Col. 1)

## '57 Cooling Sales Hold Up Well In View of Conditions

### Unitary Sales Not Too Far Below '56

DETROIT—While the 1957 air conditioning sales year must be counted as a disappointment, it was primarily because sales at the retail level failed to maintain the upward trend that characterized the sensational growth pattern since 1952.

In terms of unitary sales, the industry was not too far off 1956 figures, and the over-all dollar volume of sales for all segments of the industry might

be close to the top figure for any one year (the large built-up system category is thought by some to be ahead of last year). But the fact remains that sales in some categories failed to advance, and in some instances even decreased, and thus the disappointment remains.

In residential air conditioning, while final figures for the calendar year are obviously not yet available, the consensus that sales will decline some 15% from 1956 figures is backed by statistical experts from the Air-Conditioning & Refrigeration Institute and others who are in position to do some accurate estimating.

Thus, it is estimated that sales of residential air conditioners in the calendar year 1957 will be in the area of 145,000 to 150,000 installations. (This estimate embraces all installations  
(Concluded on Back Page, Col. 1)

## Dr. Smith To Head Carrier Research

SYRACUSE, N. Y.—Dr. J. F. Downie Smith has been elected a vice president of Carrier Corp. and will head its central Research and Development Div.

Walter A. Grant, vice president since 1953, has been designated as coordinator of all development engineering activities.

These announcements were  
(Concluded on Page 4, Col. 4)

## G-E Previews '58 Commercial Cooling Models

MIAMI, Fla.—A new line of General Electric air-cooled air conditioning units for commercial and industrial application ranging from 7½ to 20 tons capacities in split systems was previewed by G-E air conditioning distributors at the Empress hotel here recently.

G-E's Air Conditioning Div. also showed the distributors new 20 to 30-ton water-cooled self-contained models and a new 3-ton "Weathertron" heat pump for larger residences.

New products offered by the Home Heating & Cooling Dept. for 1958 represent a new departure in appearance and design, according to H. N. McMenimen, Jr., manager of the Air Conditioning Div.'s sales department.

The new products will be introduced to the public as they start coming off the production lines, he said.

On both the new water-cooled and air-cooled models, fan assembly is adjustable for air discharge vertically or horizontally. Two-step thermostat provides capacity modulations for the water-cooled models and for the 15 and 20-ton air-cooled units.

The 20, 25, and 30-ton water-cooled models and the 15 and 20-ton air-cooled air conditioners are all housed in cabinets of the same size and appearance. They measure 94½ in. high, 77 in. wide, and 43 in. deep. With the heating section added on the water-cooled models, their height is raised to 102½ in.

The FDW water-cooled models have net cooling capacities, rating according to ASRE  
(Concluded on Page 4, Col. 5)

## U. S. OKs Air Conditioning For Govt.-Built Homes, If...

WASHINGTON, D. C.—Air conditioning is now authorized for government-built homes for civilian employees and servicemen if it would be a definite advantage to comfort because of local climate.

This is part of a new policy recently announced by Percival F. Brundage, director of the Budget Bureau. The policy applies to homes built both in the United States and overseas.

## What's Holding Back Residential Sales?

### Contractor's Files Indicate that Cut-Throat Pricing, Lousy Jobs Could Hold Back Industry for Years

By C. Dale Mericle

FORT WORTH, Texas—At a time when many contractors, not to mention manufacturers and distributors, are wondering "where do we go from here?" or maybe simply "what happened?" to residential air conditioning sales in the past season or two, it might be worthwhile to look at the situation from the viewpoint of the contractor trying to make a profit in this business.

Some contractors, perhaps quite a number, are making a profit, and others — usually smaller firms such as the one and two-man operators—believe they're doing all right though actually they're probably making no more than their wages.

But the bankruptcies are not uncommon in the field, and firms

who manage to stay in business on a not much better than break-even basis sometimes wonder seriously if maybe there isn't a better way.

In hopes that the problem might be pointed up and some light shed upon it, a veteran

Details and statistics on 19 case histories from this contractor's files actually begin on page 17 and continue through page 22 of this issue.

contractor in Fort Worth recently opened his files to AIR CONDITIONING & REFRIGERATION NEWS. From his detailed records of many installations, 19 "case histories" of recent residential air conditioning jobs were selected.

These cover a wide range of systems and jobs, and prices. Selling prices of these jobs range from a low of \$800 to a high of \$2,552, and they represent simple add-on units as well as complete year-round jobs. Sizes are 3 and 5 hp.

Before discussing these jobs in detail and making any observations about them, it might be well to look at the over-all situation.

Residential air conditioning is here to stay. It has passed out of the infancy stage and probably now is enduring the growing pains of adolescence.

Sales in the past two seasons have been fair, but many people have been disappointed because  
(Concluded on Page 14, Col. 1)



## Motor Products Sells Florence Stove Holders Holland Furnace Stock To Vote on Sale Nov. 14

CHICAGO—After its earlier announcement that it was acquiring Holland Furnace Corp. common shares on the open market for "investment" purposes, Motor Products Corp. decided to sell its holdings, Arnold Maremont, chairman, said. It has done so.

"We had strong ideas on policies of the company," Maremont explained, "and when an agreement with the management could not be reached, we decided to sell." No price was disclosed, but it was reported that approximately 150,000 shares of Holland common were said to have been involved.

Holland Furnace purchased MP's shares, not individual members of management, Maremont pointed out in his announcement.

CHICAGO — Florence Stove Co. stockholders will meet Nov. 14 to vote on a recommendation by directors that the company sell its space heating business and Lewisburg, Tenn. plant to a new firm to be known as Heil-Quaker, Inc.

To be jointly owned by Heil Co., Milwaukee, and Sears Roebuck & Co., Heil-Quaker will be able to buy the space heating business and plant for book value. At the time the transaction is completed, a Florence official said the book value will be approximately \$5 million.

If the plan is approved, each stockholder of record Nov. 29 will be invited to tender to the company, for purchase at \$31.50 a share, one share of stock for each three held.

## 'Inventories Low'

### Anaconda Chief Sees Higher Copper Prices

SANTIAGO, Chile — Higher prices for copper are coming, believes Roy H. Glover, chairman of the Anaconda Co. of New York City.

Speaking at the opening of a new copper mine near here, Glover said the U. S. industries have about worked off their excess inventories of copper.

Very shortly, he predicted, copper producers will face a situation where maintaining sufficient production rather than insufficient demand will present a major problem.

"This should naturally be followed by rising prices, which are most certainly justified and needed in this expanding world," he pointed out in his speech.

## Frozen Food Locker Group Plans To Wage Push To 'Create Favorable Public Climate'

ELIZABETHTOWN, Pa.—Efforts to raise financial support for a public relations program in 1958 are now being conducted by the National Institute of Locker & Freezer Provisioners.

According to a special report to members, the organization wants to hire a public relations firm to wage a continuous campaign to "create a favorable public climate" for food plans and locker plants.

Approval of such a program was won at the Institute's annual convention last September. Efforts now are being extended to raise sufficient funds to conduct such a campaign. Cost is estimated upwards of \$25,000 per year.

"We hope to raise from \$3,000 to \$5,000 to obtain the develop-

ment of a complete and detailed program," the report said. "To do this a number of supplier members have already indicated their willingness to contribute and are being asked to provide funds specially earmarked for this project to get the program started."

Among the contemplated objectives of such a program are: To promote among urban consumers the economy and convenience of buying food in quantity for storage in freezers and lockers.

Educate the public in the use of home freezers.

Point out what consumers should look for in a good food plan and how to avoid fly-by-night operators.

Bombard publications with articles regarding the functions of locker plants, the use of home freezers, and the advantages of frozen foods.

### 3 Self-Contained Units

### A. F. Johnson Is Gibson Cooling Product Chief

GREENVILLE, Mich. — Appointment of Albert F. Johnson as product manager of Gibson 2, 3, and 5-ton air-cooled self-contained air conditioners for Gibson Refrigerator Co. was announced here by C. J. Gibson, Jr., president of the Hupp Corp. division.

The new product manager replaces J. L. Johnson, former vice president and general sales manager, who has retired. He will report to W. C. Conley, vice president in charge of Gibson sales.

A. F. Johnson joined Gibson in February, 1955, serving in the company's central air conditioning sales department and as an account manager in the company's private brands department. Previously he spent 13 years with Carrier Corp. as sales engineer in Syracuse, Cleveland, and Chicago.

A 1935 graduate of The United States Military Academy, Johnson later served four years as an instructor in mechanics, thermodynamics, and chemistry at West Point.

J. L. Johnson, retiring vice president and general sales manager, joined Gibson in 1945 after 23 years with Westinghouse Electric Corp. in various sales positions. A member of many industry associations, he was at one time chairman of the Refrigeration Committee of the National Electrical Manufacturers Association.

It is expected that Johnson will remain active in sales activities, serving in a consulting capacity in the east.

#### SEND FOR REPRINTS

Product Knowledge, Protective Maintenance, Trouble-Shooting, Adjustment, Repair of Electric Motors.

Only 40¢ each.

For your copy, clip this ad and mail with name and address to: Air Conditioning & Refrigeration News, 450 W. Fort, Detroit 26, Mich.



### A NEW THERMOBANK DESIGNED SPECIFICALLY FOR FRESH FOOD

For years, research and experience in the fresh food storage field have emphasized that most fresh food can be kept in salable condition for considerably longer time when stored at 30° to 32° with a minimum variation of temperature and humidity. The new "F" THERMOBANK provides, for the first time, an economical refrigeration system for fresh food at the 30° to 32° level and it embodies all the valuable features of the THERMOBANK re-evaporative hot gas defrost system that have made THERMOBANK the standard of the industry.

#### LIFE OF FRESH FOOD EXTENDED

With the old "off-cycle" defrosting, there are continual wide temperature and humidity fluctuations and it is not possible to maintain temperatures below 35°. The new "F" THERMOBANK eliminates "off-cycle" defrosting and maintains constant temperature and humidity by operating with the fewest possible defrost periods of the shortest possible duration; "F" THERMOBANK means less waste, longer shelf life, less dehydration, less mold and bacterial infection and retention of "freshness" during storage.

#### "F" THERMOBANK COSTS LESS

Because the "F" THERMOBANK guarantees rapid and complete defrost, equipment is safely selected for 20 hours operation. This results in the selection of a smaller THERMOBANK system and a smaller compressor giving low first cost and economical operation.

WRITE FOR BULLETIN TV-380

**KRAMER TRENTON CO.**  
TRENTON 5, NEW JERSEY

# KRAMER

## "F"

## THERMOBANK OPENS

## A NEW ERA

## IN

## REFRIGERATION

## OF

## FRESH FOODS



## Plumbing-Heating-Cooling Information Bureau Being Organized To Push Educational Programs

CHICAGO—Organization of a new industry-wide Plumbing-Heating-Cooling Information Bureau to plan and execute mass communications campaigns and educational programs were brought near completion here recently.

Basically an expansion of the 38-year-old Plumbing and Heating Industries Bureau, it represents a fusion of that Bureau with the All-Industry Plumbing and Heating Modernization Committee.

The Industries Bureau meets Nov. 25 to vote on a change in by-laws to increase the size of the board of directors from 20 to 30 and to create the new name for the organization.

The new organization is expected to:

1. Increase public respect

for the industry and its products through a greater knowledge of their importance in daily living.

2. Increase and stabilize employment in all segments of the industry.

3. Increase sales volume in all fields.

It represents a joint activity of manufacturers, wholesalers, contractors, and journeymen.

At a meeting of the Modernization Committee Oct. 24, a special interim subcommittee reported that it had raised nearly \$100,000 in pledges for funds for the new group. All plans were ready for the new organization to get to work, it added.

William A. Landers, subcommittee chairman, said funds had been pledged on the basis of a minimum contribution of each

organization at the rate of \$1 per employee.

Contributions on this basis have been sought from companies, individuals, associations, and unions. Based on this unit of contribution, he said, the potential program could be funded at \$1 million.

Landers asserted that so far, all organizations contacted had contributed and pledged to support the expanded program financially.

Six goals of activity have been set for the new Information Bureau:

1. Conduct a year-round program aimed at the local level.
2. Set up a school of plumbing-heating-cooling marketing to train merchandisers capable of keeping up with the market.
3. Establish a consumer in-

formation and education headquarters.

4. Promote intra-industry communication.

5. Promote market research and market discovery.

6. Coordinate all efforts with the national program of "Action" in home remodeling and neighborhood reclamation, it was stated.

Until such time as the new bureau is in operation, an operating committee of the Industries Bureau will work with the interim subcommittee of the Modernization Committee, the group said.

The joint committee is headed by Howard L. Spindler, vice president in charge of public relations, American Radiator and Standard Sanitary Corp., it was noted.

The committee is looking for a top level industry leader to take the reins of the new bureau on a full time basis, it was explained.

## Buffalo ASRE To Tour Marine Trust Bldg.

BUFFALO—A tour of the newly air conditioned office of the Marine Trust building will be a highlight of the Nov. 11 meeting of the Buffalo Section, American Society of Refrigerating Engineers, the group announced.

This building has 970 tons of installed air conditioning with cooling distributed through the building by three different types of cooling systems, it was pointed out. Induction units handle the perimeter with medium velocity air cooling the interior zones. Other areas are serviced with hot and cold water units.

The tour will start at 4 p.m. at the Marine Trust building, with a social hour dinner and speaker at the University Club, Delaware Ave., it was explained.

# MARCO MOTORS

Powered more air conditioners  
during the 8-year period of  
the industry's greatest growth because:

**Performance 99.44% perfect  
in the field!**

**Multiple speeds are WOUND IN!**

**Marco Motors pass the RAIN test!**



**MARCO INDUSTRIES, Inc.**  
WOMELSDORF, PENNSYLVANIA

*the only company devoted exclusively to the manufacture of motors for the Air Moving Industry.*

*For more information about products advertised on this page use Information Center, page 26.*



## Iron Fireman Ups Cox to President

CLEVELAND—Lewis J. Cox, executive vice president and chief executive officer of Iron Fireman Mfg. Co., has been elected president of the firm by the board of directors.

Associated with the company for the last 28 years, Cox was named vice president in 1951, and promoted to chief executive last April after Wayne F. Strong, former president, died.

Net earnings of the firm for the 12 months ended Sept. 30 were announced as having climbed to \$582,686 compared with \$302,761 for the previous year.

Sales showed a substantial gain for the year totaling \$27,462,780 as against \$25,326,005 in 1956. Directors declared the regular quarterly dividend of 15 cents a share, payable Dec. 2.

## Amana Sues CBS for \$9 Million for Anti-Trust 'Advertiser Discrimination'

CHICAGO—Asking \$3 million on each of three counts, Amana Refrigeration, Inc. filed a \$9 million treble-damage anti-trust counterclaim against Columbia Broadcasting System, Inc. in Federal Court here.

### CHARGES DISCRIMINATION IN NETWORK TIME SALES

Amana charges discrimination against the firm in selling time on the network, making advertisers buy time on stations which they do not want, and refusing to sell advertisers time to sponsor shows which CBS does not have financial interest in unless the advertiser buys another program produced or owned by the network.

Countering after CBS had first filed suit against Amana

for \$284,545 claimed due for costs of seven spot ads on "The Phil Silvers Show" sponsored by Amana, the firm says the amount owed CBS was actually \$252,431 because of an offset agreement. It claims it paid this sum Oct. 23 and denies that refusal to pay the first-mentioned sum was wrongful.

Amana charges CBS with giving other advertisers, including Amana's competitors, greater discounts on rates for time on the network and says the highest discount it received was 5% while others received cuts up to 25% which "substantially lessened competition in the sale of its products."

### 'MUST BUY TIME OVER STATIONS STIPULATED'

That in order for an advertiser to purchase time from the network, it is compelled to buy time over all the stations stipulated by the network which, Amana contends, includes all stations owned by CBS.

In this way, Amana continues, advertisers can be forced to buy time on stations in areas where there is no market for their products and this takes time away from other stations.

A tie-in program in which CBS favors programs it produces itself or has an acquired interest in is the third charge. Amana states that in May, 1955 CBS refused to sell it time over the network to sponsor a program in which the network did not have an interest until Amana bought time for a program in which CBS did have an interest. This policy, allegedly carried on for several years, causes advertisers to buy programs for higher prices and of different qualities than the otherwise available TV programs of other producers, Amana charges.

### Chief Executive

## Lehigh Elects Hammond To Succeed Shumann

EASTON, Pa.—Lafayette E. Hammond has been elected president of Lehigh, Inc., manufacturer of refrigeration condensing units and compressors, malleable and grey iron castings, and automatic vending machines, it was announced by Frank E. Shumann, chairman of the board.

Leroy M. Bissett and Clayton L. Coulter were elected vice presidents.

Hammond, who has been chief engineer of Lehigh since 1948, succeeds Alvin A. Shumann who has been named chairman of the finance committee.

Bissett, who joined Lehigh in 1946, will continue as general manager of Lehigh Mfg. Co., the company's refrigeration products division, a position he has held since 1952.

Coulter, who becomes vice president in charge of purchasing, has been associated with Lehigh for 11 years and a director since 1953.

It was also announced that the company's foundry division will now be known as Lehigh Inc. Richard W. Crannell was elected president.



DR. SMITH



W. A. GRANT

## Carrier Names--

(Concluded from Page 1, Col. 4)

made by Cloud Wampler, chairman of the board, who stated, "Upon the completion of the new research center scheduled for occupancy early in 1958, Carrier will have spent approximately \$5 million during the last three years on research and development facilities, the total investment in these areas now being \$7 million."

### APPOINTMENTS EFFECTIVE JAN. 1

The appointments of both Dr. Smith and Grant will become effective Jan. 1, according to Wampler.

For the past ten years Dr. Smith has been dean of engineering at Iowa State college. He also has served as director of its Engineering Experiment Station and Engineering Extension Service.

He was born in Scotland and when only 13 years of age became an apprentice engineer with Albion Motor Car Co., which sponsored his further education. In due course he was graduated with special distinction from the Royal Technical college at Glasgow and Glasgow university.

### 'RAMBLIN' WRECK IN '23'

In 1923 Dr. Smith came to the United States and a year later joined the faculty at Georgia Institute of Technology. His next assignment was at Virginia Polytechnic Institute. From each of these, although teaching full-time, he obtained a graduate degree. At Georgia Tech he received the first master of science degree in engineering given by that institution.

From 1928 to 1936 he studied and taught at the Harvard Graduate School of Engineering where he earned his doctor of science degree and specialized in the field of heat transfer by conduction and convection.

He then returned to industry, first with Budd Mfg. Co. in Philadelphia and then United Shoe Machinery Corp.

### COOLING AUTHORITY

Grant joined Carrier in 1928 and is an outstanding authority in the field of air conditioning engineering, especially application and development, it was pointed out. He studied at Amherst college and Columbia university and has both science and engineering degrees.

With the late Dr. Willis H. Carrier, he is co-author of a widely-used textbook on air conditioning. He has been responsible for many Carrier advances in the field of aerothermodynamics, absorption refrigeration, and heat transfer.

During the past three years separate engineering facilities have been provided for each of the major operating divisions. The effective utilization of these with a minimum of duplication will be the basic responsibility of Grant.

### In Third Quarter

## Trane Sets Record Sales, Net Profit

LA CROSSE, Wis. — The Trane Co., manufacturer of air conditioning and heating equipment, reports record sales and net profit for the third quarter.

In figures just available, Trane shows \$60,289,102 consolidated sales for the first nine months of 1957, a 9½% increase over 1956 figures of \$55,030,827. Net profit moved up about 6% with \$4,134,269 through September, 1957, as against \$3,907,395 for a comparable period last year.

For the three months ending Sept. 30, consolidated sales were \$20,526,768 with net profit \$1,493,386. The 1956 three-month totals were \$18,180,940 in sales and \$1,333,523 in net profit.

Net earnings per share for the third quarter this year were 70 cents and for the first nine months \$1.94, based on 2,129,846 shares of common stock outstanding.

Comparable 1956 figures are 67 cents net earnings per share for the third quarter and \$1.97 for the first nine months, based on 1,979,846 shares outstanding Dec. 31, 1956.

"This stock sale is reflected in the substantial jump in total current assets to \$38,120,097 for 1957 compared with \$30,492,358 for 1956," it was stated. "Working capital is \$29,539,879 at Sept. 30, 1957, as against \$22,371,184 last year."

According to Minard, part of the proceeds of this sale are just now being used in the firm's continuing expansion program including a new plant in Clarksville, Tenn., where Trane plans to produce central-type residential air conditioning units, a plant nearing completion in La Crosse to manufacture special application heat exchangers, in addition to doubling of the research and testing center, and additions at Scranton, Pa.

## G-E Previews--

(Concluded from Page 1, Col. 5)

standard, of 240,000 (20-ton), 300,000 (25-ton), and 360,000 (30-ton) B.t.u.h. Dehumidifying capacity is 25% of net cooling capacity.

The air-cooled units have net cooling capacities as follows, with dehumidifying capacity at 30% of these figures: FDA-75, 90,000 B.t.u.h.; FDA-100, 120,000 B.t.u.h.; FDA-150, 180,000 B.t.u.h.; and FDA-200, 240,000.



## NEW 17-CASE Cap. SELF-CONTAINED BEVERAGE COOLER \$250

6 or more \$235—10 or more \$225

Stainless steel doors and track. Top, front and 2 sides finished in "Multi-kolor". All radius and ball corners. Tecumseh unit, concealed coils. No interior obstructions of unit or blower. Size—54" l. x 26" w. x 39" h.

4-BROTHERS REFRIGERATION MFG. CO., INC. 1427 S. 8th St. Phila. 47, Pa.

# HERE'S SIMPLE, ECONOMICAL PROTECTION AGAINST MOTOR OVERLOAD



Model SU100L actual size

**MIGHTY MITE**  
MOTOR PROTECTORS

MIGHTY MITE motor protectors are miniature thermal controls which automatically break the circuit when motor temperature exceeds a safe operating level. This offers continuous protection against overloading and voltage variation. It eliminates charring of insulation and other undesirable effects of overheating. MIGHTY MITES have helped many products to be safer and more dependable in operation, and therefore, easier to sell.

### Check These Features

- MIGHTY MITES are accurately pre-calibrated at our factory to your particular motor requirements.
- Sizes available as small as 3/4" long x 5/16" wide.
- Will fit practically any stator, regardless of lamination shape.
- Leads or terminals furnished to meet specific needs.
- Wide range of models in capacities up to 1/3 h.p., 115/230 volts, for break-temperature requirements up to 200° C.
- MIGHTY MITES are tamper-proof to provide the most dependable and safest protection.
- No change in normal motor assembly procedure.
- Packaged and labeled for production line assembly. No further adjustment or other handling required.

WRITE TODAY FOR SAMPLES... ENGINEERING AID AVAILABLE



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## Inside Dope

By GEORGE F. TAUBENECK

(Concluded from Page 1, Col. 1)  
Sputnik? O.K., skeptic: read this.

Snooper, an unmanned ion-propelled rocket that will travel at speeds near 100,000 m.p.h., and could circle the earth for a year on 220 lbs. of fuel, is "in the works," we heard recently in Washington.

This space ship would weigh 3,300 lbs. and be capable of carrying 1,500 lbs. of instruments. The ratio of weight-to-load would be far higher than that of Sputnik.

Incidentally, we were informed about Snooper (at the Conference for Small Businessmen) several days before Sputnik was launched.

That aforementioned Snooper, capable of reaching Mars in a relatively short time, would be propelled by chemical rocket fuels to a point 300 miles above the earth before conversion to ion propulsion. (As a source of sustaining power, ion propulsion can be used only beyond the pull of gravity.)

Fuel for the ion motor would derive from alkali metals, such as sodium, lithium, rubidium, or cesium. These metals yield large quantities of energy when they are in contact with a hot platinum or tungsten surface.

Here's how a General Motors man explained one type of ion propulsion to "Dope" last week:

Cesium would be kept in a molten state in a tank heated to 100° F. This liquid fuel then could be pumped into an atomizer which would spray it into a vaporizing chamber (with walls heated 100° above the 1,300° boiling temperature of cesium).

Resulting vapor would pass through a series of hot platinum or tungsten grids where it would be ionized. Said ions then would be propelled through a magnetic field to push the rocket forward.

Power to heat the cesium and accelerate the ions could come either from big sheets of solar batteries or from atomic reactors.

Because the rocket would be unmanned, no heavy shielding around the reactor would be required. Therefore an atomic power-unit could be relatively light-weight.

An ion-powered Space Ship could make the journey to Mars in about 400 days, hitting a peak speed of 100,000 m.p.h., as compared to Sputnik's 18,000 m.p.h.

P.S.: Last year the Defense Department was authorized to spend \$92 million on the space satellite project. Simultaneously the U. S. Dept. of Agriculture

spent \$80 million keeping cheese prices high by buying up cheese which consumers wouldn't purchase.

Write your own moral.

### Refrigerated Space Ships

Many problems have arisen in man's attempt to project himself into outer space. And refrigeration is doing its part to help solve them.

How man can survive not only the terrific speeds and their attendant high temperatures, but how space ships can re-enter the earth's atmosphere without burning up are troublesome—but solvable—problems.

Coming soon is a vacuum laboratory (built like a thermos bottle) which will simulate conditions in the rare air of outer space.

A man clad in a space suit, kept cool by a built-in refrigeration system, will perform experiments on electronic equip-

ment and ion-powered rockets in this lab.

Without refrigeration the man being tested could live for only a minute-and-a-half in the chamber. He could retain consciousness for only five seconds.

Even though an ion-powered rocket would travel at unbelievable speeds, an even faster space device—a photon rocket powered by light—is proposed.

At the moment this idea is a "mathematical exercise." But don't bet that your son won't take a ride to Venus in this ultra-refrigerated "space ship."

So who needs a long vacation in Florida? And wouldn't an African safari seem tame by comparison?

### Last Laughs

Water pipes connected to the transmitter of radio station KTOK (Oklahoma City) burst, forcing the station off the air.

Irate woman who called the station was told the reason.

"Why don't you announce it on your radio programs, then?" she bristled. "We people have a right to know."

During a conference the Sales Manager frequently interrupted his solo by turning to an assistant and asking:

"Isn't that so, Joe?"

"Yes, sir!" Joe answered every time.

Later Joe joined some of the conferees in a taproom.

"Boys, I'm not a yes man," he protested. "When the Boss says no, I say no!"

Experienced usher warned a trainee:

"Every member of this church is a good, kind, decent Christian—until you seat somebody else in his or her accustomed pew."

Ministers are human. They

are notoriously underpaid, and "the flesh is weak."

Harrassed minister, whose wife was bugging him because of their poverty, ran away with one Sunday's collections plus the fund for foreign missions.

Two weeks later the errant was apprehended and returned by the county sheriff. To the latter's amazement, the Elders refused to prosecute.

"We'll let him work out his debt in sermons," was their verdict.

### Add Definitions

**BUDGET:** Futile attempt to live below your yearnings.

**EYEWITNESS:** Someone who thinks he saw something somewhere somehow in the vicinity, but isn't sure.

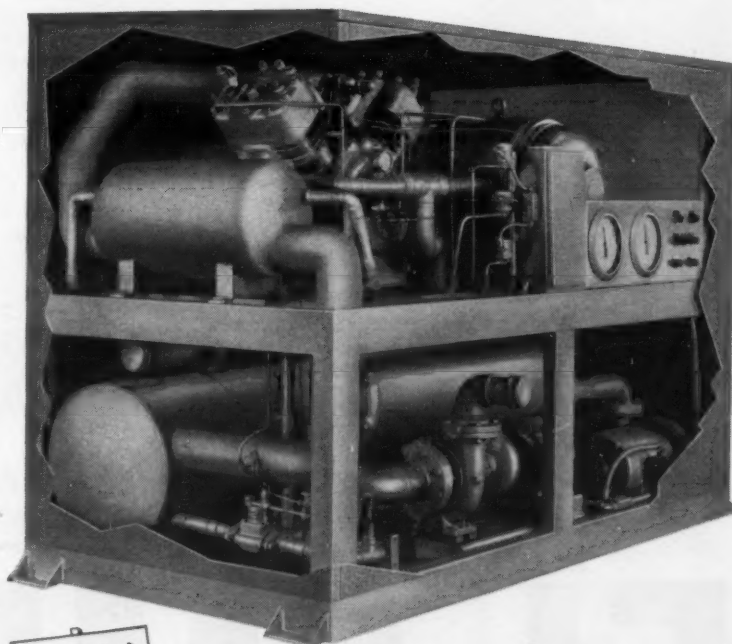
**BRIDEGROOM:** Fellow who buys an ounce of fun with a ton of trouble.



BOOTHS  
525-526

## See OUTSTANDING B&G ADVANCES IN PACKAGE COOLERS AND REFRIGERATION COMPONENTS

B&G presents a complete line of air conditioning and refrigeration equipment, alive with new, exclusive features! New efficiencies have been designed into these products which materially reduce space requirements—improve operating economy—add to life of the equipment.



### COMPLETELY SELF-CONTAINED PACKAGE LIQUID COOLERS— 7½ to 75 tons

Compare the standard equipment of the B&G Package Liquid Cooler with that of any other... see for yourself that you can have B&G quality at smaller installed cost. For example—

**No inside wiring.** All controls furnished—completely wired and interlocked.

**No inside piping.** All pumps are mounted, piped and electrically interlocked.

**No framing.** All equipment is mounted on permanent steel frame.

**No metal forming.** Heavy gauge steel jacket is sound-deadened, Hammerloid finished.

**No insulating.** Suction line and heat exchanger are fully insulated.

**No testing.** Fully tested under specified operating and varying load conditions.

**No extras.** Furnished complete with gauges, compressor motor and flywheel, increment start, heat exchanger and full charge of Freon.



### EVAPORATOR—50% smaller

This Code stamped ASME Evaporator features tubing with specially designed interior metallic spline which almost triples inside heat transfer area... reduces unit size and Freon charge. Tube design permits U-bend construction without losing contact between spline and tube. B&G Evaporators are un-

conditionally guaranteed against tube damage from freeze-ups! Leak-proof, styrene insulation is molded directly on shell.



### CONDENSER—2 to 200 tons

One-third smaller than previous models—less Freon needed. Exclusive design lowers pressure drop—raises operating efficiency. Tubes are rigidly supported in stacks with metal-to-metal contact between fins for free drainage of condensing Freon. Expensive sight glasses are eliminated by providing three liquid level openings. ASME Code stamped for Freon 12 and 22.

### QUIET PUMPS

B&G 1522 Pumps are noted for quiet, leak-proof operation—ideal for cooling tower applications.



## BELL & GOSSETT

C O M P A N Y

Dept. FA-47, Morton Grove, Illinois

Canadian License: S. A. Armstrong Ltd., 1400 O'Connor Drive, Toronto 16, Ontario

### WANTED Sales Representative

Styrofoam Pipe Covering and Foam Plastic Insulation Products for metropolitan New York, New England, West Coast, and several other excellent protected territories. State lines now carried. Excellent Financial Arrangement.

Reply to Box No. A5904,  
Air Conditioning &  
Refrigeration News



# FIELD-PROVEN...RUGGED

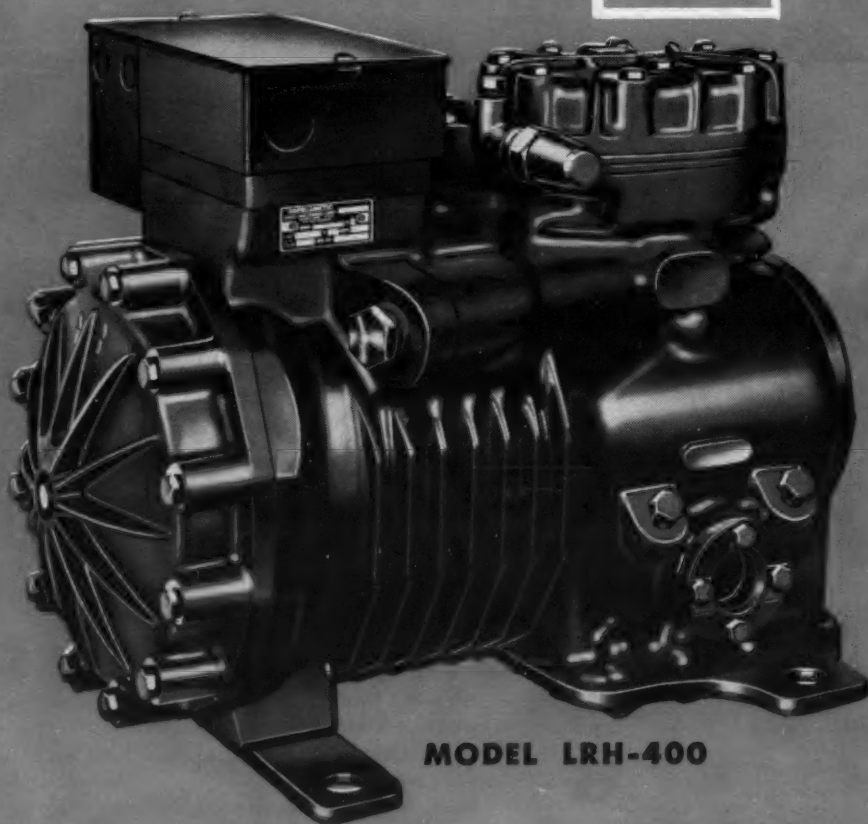
**ACCESSIBLE**

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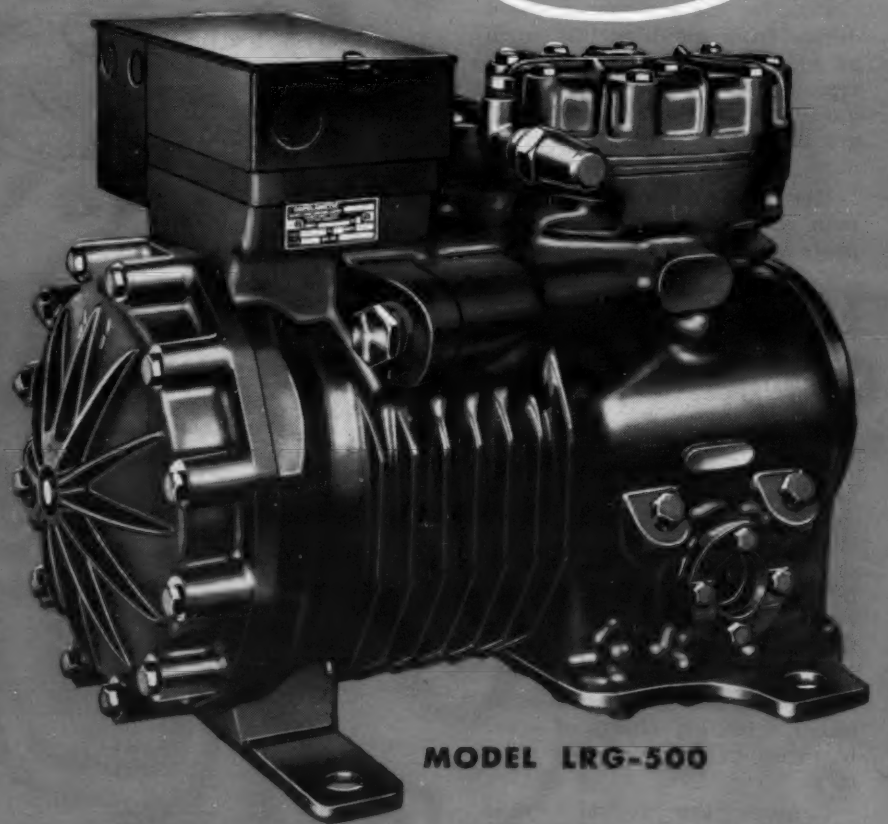
H.P. and

# 5

H.P.



MODEL LRH-400



MODEL LRG-500

# COPECLAMETIC

## MOTOR-COMPRESSORS

## GIVE YOUR EQUIPMENT

## SUPERIOR PERFORMANCE



# ...QUIET...LOW-PRICED

The hottest news yet in cooling! That's the best way to describe these latest achievements of Copeland research and development. They are just what the industry needs for the big residential and commercial market utilizing these sizes.

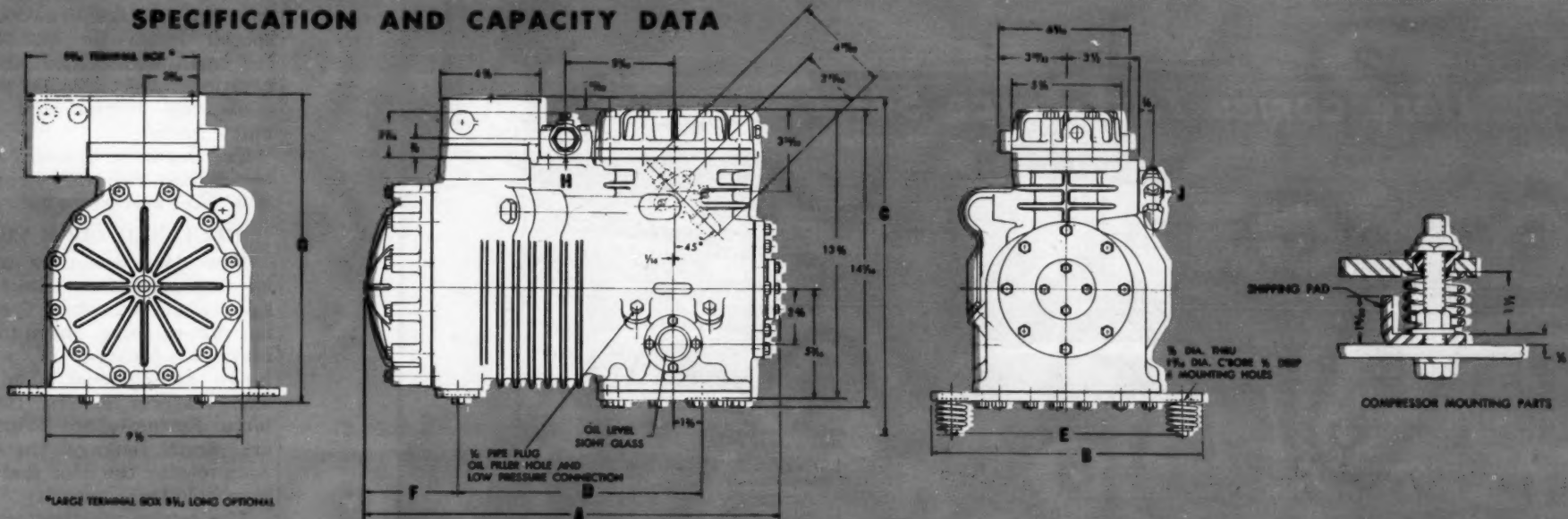
These new compact Copelametic motor-compressors will give all the long-time, carefree service traditionally engineered into every Copeland product. They're quiet, rugged, accessible.

And, of course, they have been field-proven and are competitively priced. All single-phase models are inherent-protected — three-phase models available with external inherent-protectors. Be sure and see them at the exposition; better yet, test one in your own product.

These motor-compressors are added evidence you can always count on Copeland.



SPECIFICATION AND CAPACITY DATA



DIMENSIONS AND SHUT-OFF VALVES

Model	H.P.	A (Max.)	B (Max.)	C	D	E	F	G	H—Suct. SOV		J—Discharge SOV	
									Tube O.D.	Type	Tube O.D.	Type
LRH-400	4	19 1/16"	13"	16 1/32"	11 1/8"	11"	4 1/16"	14 1/32"	1 1/8"	S	3/8"	S
LRG-500	5	19 1/16"	13"	16 1/32"	11 1/8"	11"	4 1/16"	14 1/32"	1 1/8"	S	3/8"	S

COMPRESSOR DISPLACEMENT, REFRIGERANT, OIL CHARGE, WEIGHT

Model	H. P.	Cyls.	Bore	Stroke	CFH Disp. @ 1750 R.P.M.	Refrig.	Oil Recharge	WEIGHT	
								Net	Shipping
LRH-400	4	2	2 1/4"	1 1/8"	698	F-22	5 1/2 pt.	236 #	253 #
LRG-500	5	2	2 1/8"	1 1/8"	815	F-22	5 1/2 pt.	236 #	253 #

CAPACITY DATA (BTU/HR.)

Model	Evap'g Temp.	Suct. Press.	DISCHARGE PRESSURE											
			170.1 #	183.7 #	197.9 #	212.9 #	228.7 #	245.3 #	262.6 #	280.5 #	298.3 #	317.9 #	338.0 #	359.7 #
			CONDENSING TEMPERATURE											
			90°F.	95°F.	100°F.	105°F.	110°F.	115°F.	120°F.	125°F.	130°F.	135°F.	140°F.	145°F.
LRH-400	45°F.	76.6 #	68625	66500	64375	62000	59895	57750	55375	53000	50875	48250	45875	43625
LRG-500	45°F.	76.6 #	78300	76000	73600	71500	69100	66900	64500	61900	59600	57500	55200	53000

Based on 65°F. Suction Gas Temperature and no Heat Exchanger.

POWER CONSUMPTION\* (WATTS INPUT)

Model	Evap'g Temp.	Suct. Press.	DISCHARGE PRESSURE											
			170.1 #	183.7 #	197.9 #	212.9 #	228.7 #	245.3 #	262.6 #	280.5 #	298.3 #	317.9 #	338.0 #	359.7 #
			CONDENSING TEMPERATURE											
			90°F.	95°F.	100°F.	105°F.	110°F.	115°F.	120°F.	125°F.	130°F.	135°F.	140°F.	145°F.
LRH-400	45°F.	76.6 #	4375	4545	4710	4890	5060	5320	5490	5690	5890	6040	6210	6430
LRG-500	45°F.	76.6 #	4770	4950	5110	5280	5460	5650	5820	6020	6210	6390	6580	6760

\*At 230/1/60

MOTOR CURRENT\* (AMPERES)

Model	Evap'g Temp.	Suct. Press.	DISCHARGE PRESSURE											
			170.1 #	183.7 #	197.9 #	212.9 #	228.7 #	245.3 #	262.6 #	280.5 #	298.3 #	317.9 #	338.0 #	359.7 #
			CONDENSING TEMPERATURE											
			90°F.	95°F.	100°F.	105°F.	110°F.	115°F.	120°F.	125°F.	130°F.	135°F.	140°F.	145°F.
LRH-400	45°F.	76.6 #	20.15	20.90	21.70	22.55	23.43	24.50	25.43	26.33	27.08	27.83	28.80	29.80
LRG-500	45°F.	76.6 #	22.0	22.8	23.7	24.5	25.2	26.1	27.0	28.0	29.0	29.8	30.6	31.4

\*At 230/1/60





## Frigidaire 'Refines' Sheer Look--

(Continued from Page 1)

The new built-in ejector in developed for refrigerators as well as companion ranges, washers, dryers, and built-in appliances—turquoise and sunny yellow. Fashionable charcoal gray, pink, and white round out a color selection for homemakers.

### AUTOMATIC DEFROST

The food compartment of Cold Pantry models with "flowing cold" features automatic defrosting. The concealed refrigerating plate which cools the compartment dissipates frost as fast as it is formed, say Frigidaire officials. Any excess moisture in the food compartment drains out through a vermin-proof "moist-minder" in the bottom of the cabinet and is evaporated automatically. Chilled air is moved gently through the cabinet by a small concealed fan.

The new built-in ejector in the big bottom freezer of Cold Pantry refrigerator models provides instant ice service. In operation, the ice tray is inverted and slid into the ejector. A light touch on the U-shaped lever will produce a shower of ice cubes which are automatically stored in a bin below.

A portable version of this ejector, available as an accessory, will fit other Frigidaire refrigerators and food freezers.

A new "pantry door" provides controlled temperature butter storage, plus shelves and compartments for dairy products, small jars, tall bottles, and half-gallon milk containers.

A "picture window" storage unit for fresh vegetables and fruits, swings out of the door. New adjustable moisture control vents help keep fresh produce garden-fresh. Removable



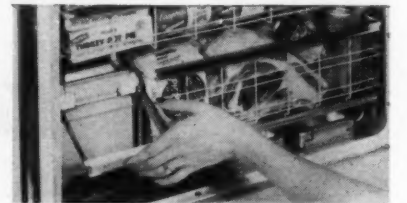
SHEER LOOK styling has been incorporated into Frigidaire's 1958 upright freezers. This 14.2-cu. ft. "Imperial" model will store 497 lbs. of frozen food and is equipped with automatic interior light, "safety signal-light," adjustable temperature control, and new "safety-seal" door.

aluminum shelf fronts in the door make cleaning easy.

In the food compartment, roll-out shelves bring food out into the open. Other additional conveniences include a porcelain-



LEFT: This new 1958 sheer look Frigidaire "Cold Pantry" refrigerator has 12.5 cu. ft. of food storage facilities. Full-width shelves roll out for food selection and special drawers hold eggs and fresh meat. "Picture window" fruit and vegetable "Hydrator" swings down out of the door.



RIGHT: Instant ice service is a feature of Frigidaire's 1958 refrigerators. Invert the tray and slide it into the slot. Handle of "Ice Ejector" responds to shower cubes into big party-sized slide-out bin below.



## NEW 1958 CHEVROLET TRUCKS WITH NEW HUSTLE! NEW MUSCLE! NEW STYLE!

*Just look at all they offer  
that's new and better... and  
you'll see why these new Chevies  
are the fleetest, sturdiest,  
handsomest dollar-savers yet!  
Meet Chevrolet for '58!*

### NEW LIGHT-DUTY APACHES

Thrifty Apaches offer three new Step-Vans complete with walk-in bodies. With high-capacity panels, pickups and four-wheel drive models, this expanded light-duty lineup has a dollar-saving answer to your delivery chores.

### NEW MEDIUM-DUTY VIKINGS

Hardy Vikings roll in with nine brand-new models, offering new cab-to-rear-axle dimensions for improved semi-trailer, dump, stake and van-type operations. Options available boost GVW ratings all the way to 21,000 lbs.

### FAMOUS 6's OR SHORT-STROKE V8's

The engine lineup is full of new pep and power—whether you choose a 6 famous for economy or a high-compression V8. Look over Task-Force 58 at your Chevrolet dealer's... Chevrolet Division of General Motors, Detroit 2, Michigan.



SEE THE LATEST EDITIONS OF THE "BIG WHEEL" IN TRUCKS—1958 CHEVROLET TASK-FORCE TRUCKS

For more information about products advertised on this page use Information Center, page 26.

finished fresh meat drawer, extra drawer for fresh vegetables, two egg storage drawers, and special removable half-shelves for small items. Also, there is additional shelf area for storing more tall bottles and other bulky foods.

The separate freezer at the bottom has two roll-out baskets plus three special ice cube trays.

### RECESSED DOOR TRIM

New door design is marked by a recessed door trim that is smooth and unbroken. There are no dirt-catching, hard-to-clean crevices, because of a new hinge arrangement. The door also features a new two-way latch. Spring-loaded nylon rollers firmly engage the latch, compressing the door seal to assure cold-tight security.

The refrigerator compartment is gleaming white, complemented by new frosty turquoise and varying shades of attractive dark green.

In the room air conditioner line, the new vertical units include 1-hp. Imperial and Super models which operate on 208 and 230-volt systems together with a ¾-hp. 7½-ampere Deluxe model for 115-volt circuits. Also there are two horizontal Imperial models of 1½ and 2 hp.

The vertical models are versatile when it comes to installation. They can be mounted in double-hung windows, casement windows, or through the wall.

### CAN MOUNT 'ALL-OUTSIDE'

For householders who prefer an all-outside installation, there is a kit that makes it possible to mount the unit in either the top or bottom of the window, and the window can be raised or closed without disturbing the seal. The outside overhang is held to a minimum because of the slim, trim cabinet design.

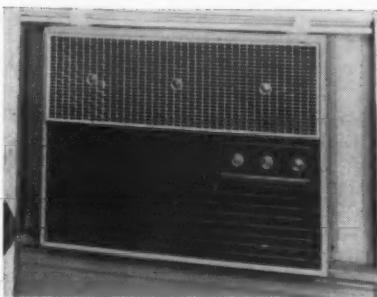
When installed in a window in the conventional balanced position, the overhang inside and outside is only slight, thanks to the new styling. The unit also can be installed flush with the inside or outside wall.

A special metal cabinet sleeve assembly, capped with protective panels inside and out, is available for through-the-wall installations.

The 1958 conditioners feature a newly-designed "dehumid-coil" with a unique tubing arrangement said to provide

(Concluded on next page)





VERTICAL "Imperial" 1-hp. room air conditioner by Frigidaire also has sheer look styling.

## Frigidaire --

(Concluded from preceding page) more efficient air contact for dry cooling and greater moisture removal. Cool, dry air provides a higher degree of comfort for the user.

Lower coil temperatures also increase dehumidifying efficiency. The units feature a "pre-cooler" that lowers the temperature of refrigerant entering the "dehumid-coil" by as much as 20° F.

Filters in the 1958 Frigidaire units are constructed of one-half inch fibrous glass. They are easily removed from the front of the unit without using tools of any kind, or removing front.

Controls on the 1958 vertical models are designed for ease and flexibility of operation. All models are equipped with thermostatic controls. Vertical models are equipped with a two-speed control for "high" and "low" fan, and "high" and "low" cooling.

### FEATURES 3-WAY 'AIR CONTROL'

In addition, the 1-hp. Imperial model features a 3-way "air control" that provides normal cooling and circulation of room air; a "fresh air" setting for mixing outside and room air, and an "exhaust" setting to discharge smoke and stale air.

The Deluxe ¾-hp. and Imperial 1-hp. units have rotating louvers behind the discharge grille.

Frigidaire food freezers have the new sheer look styling in the upright models.

One of the new upright freezers, and there are two of them, is styled to match the 14.4-cu. ft. Cold Pantry refrigerator. This food freezer, the 14.2-cu. ft. Imperial model can be installed side by side with the refrigerator, or at the opposite end of a cabinet arrangement.

This Imperial food freezer is equipped with four full-width shelves, three of which are refrigerated. One of the shelves is removable, providing room for storing extra bulky items. A full-width sliding basket below stores special food items.

The door of this food freezer has five removable shelves and a removable juice can rack to make cleaning easier. When the door is opened the interior is illuminated automatically. There is an adjustable temperature control, a "safety seal" door, and a "safety signal light" that glows to reassure that proper temperatures are maintained.

Many of the important basic features are carried over in a Deluxe upright food freezer with the same storage capacity. Both models are available with right or left hinged doors. These have built-in locks.

Frigidaire's chest-type freezers are available in two sizes—12.5 and 17.5 cu. ft. There is a "quick-freezing" shelf, plus two

## REFRIGERATORS

### Super Series:

\*SA-8-58—8-cu. ft. apt. house refrigerator ..... \$199.95  
\*S-8-58—8-cu. ft. refrigerator ..... 219.95

### Deluxe Series:

\*D-11-58—10.8-cu. ft. refrigerator ..... 249.95  
\*D-13-58—12.8-cu. ft. refrigerator ..... 289.95  
\*FD-104-58—10.4-cu. ft. refrigerator, Cyclamatic ..... 349.95

### Imperial Series:

\*FI-123-58—12.3-cu. ft. refrigerator with separate food freezer at top, Cyclamatic ..... 419.95  
\*FI-122-58—12.3-cu. ft. refrigerator with Cyclamatic and separate food freezer at top ..... 469.95

### Cold Pantry Series:

\*CP-125-58—12.5-cu. ft. single door refrigerator with separate food freezer at bottom of cabinet ..... 549.95  
\*CP-144-58—14.4-cu. ft. two-door refrigerator, separate food freezer at bottom of cabinet ..... 629.95

\*Available with right or left-hand doors at no increase in cost.

†Available in Turquoise, Mayfair Pink, Sunny Yellow, and Charcoal Gray at prices shown.

sliding storage baskets and a units have built-in locks. movable food divider.

Chest models are equipped latest innovation in the field of with automatic interior lights. electric cooking with its Lids are counterbalanced. Both "spatter-free" broiler grill on

## FOOD FREEZERS

### Upright models:

UFD-142-58—14.2-cu. ft. Deluxe ..... \$369.95  
UFI-142-58—14.2-cu. ft. Imperial ..... 419.95

### Chest models:

CFV-125—12.5 cu. ft. .... 379.95  
CFV-175—17.5 cu. ft. .... 499.95

## ROOM AIR CONDITIONERS

### Super:

AS-100-58—1-hp., 208-volt, 230-volt, vertical model ..

### Deluxe:

AD-75L-58—¾-hp., 115-volt, 7½-amp., vertical model ..

### Imperial:

AI-100-58—1-hp., 208-volt, 230-volt, vertical model ..

AI-150-58—1½-hp., 208-volt, 230-volt, horizontal model ..

AI-200-58—2-hp., 208-volt, 230-volt, horizontal model ..

the 1958 Custom Imperial range with new sheer look.

This automatic broiler is designed to solve the oven cleaning chore for homemakers and, at the same time, provide a new

concept of broiling.

The user sets a new broiler control to "rare," "medium," or "well-done" and everything else is automatic. Shelf-shifting is eliminated because the position of the "spatter-free" broiler grill is always the same.

The broiler grill is comprised of a high-walled pan with grid that fits into a shallow pan, holding a small amount of water. Hot fat from meat stays in the high-walled doubledeck broil pan and does not spatter the ovens. Because the bottom of the pan is water-cooled melted fat does not harden or burn, but remains fluid.

Another convenience is an automatic electric meat-tendering device that removes the guesswork from roasting. The home-maker sets "meat tender" dial at the required temperature, inserts a sensing device in the roast and the range takes over. A buzzer signals when the meat is done to taste.

## RX MIXED-FLOW BLOWER UNIT: A TORRINGTON 1st

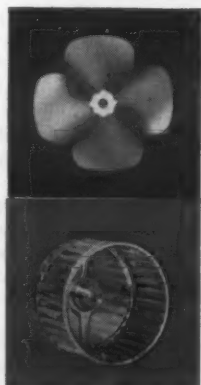
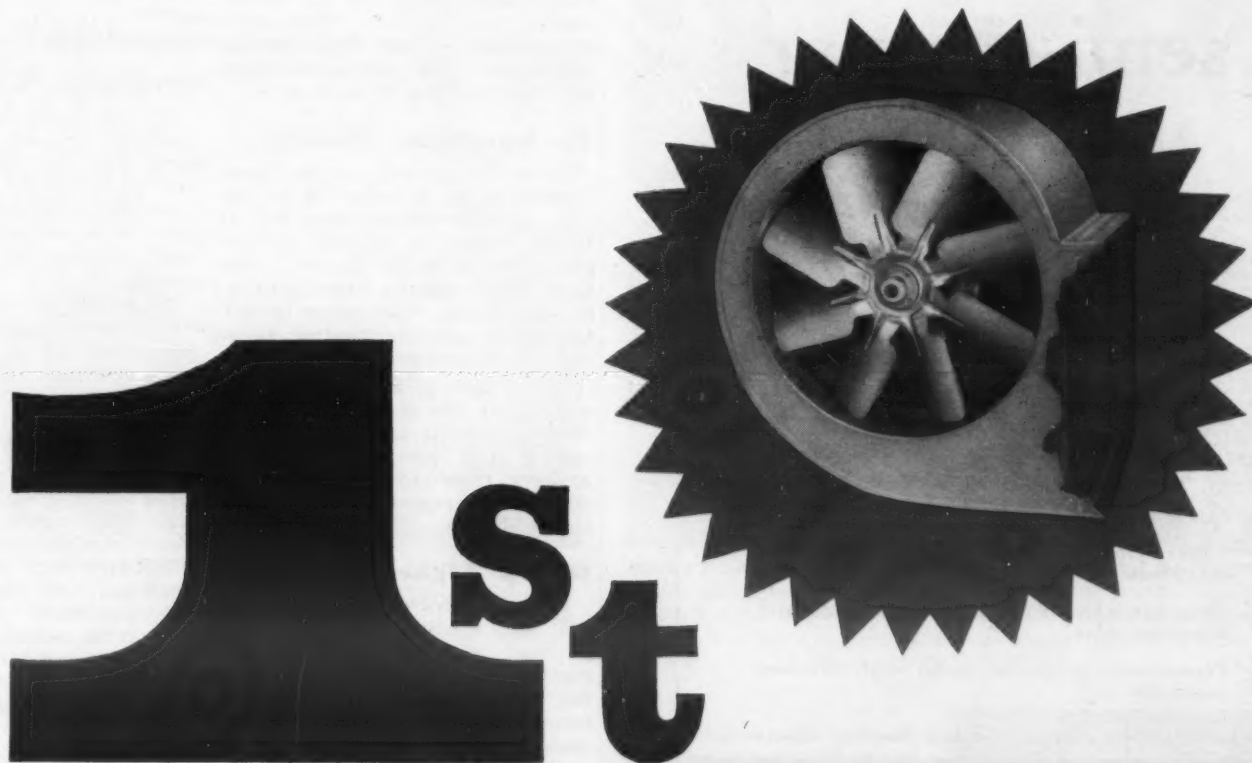
The Torrington RX Radiax blower introduces a new development in air impeller engineering.

*It is a direct drive mixed-flow unit employing an exclusive Torrington design concept which results in the conversion of axially-developed air pressure into a radial flow pattern.*

The result of this design breakthrough is a versatile unit that can be tailored to an extended range of customer needs by modification of the axial fan configuration to exact performance specifications. This eliminates dependence upon a variety of different sized units for varying requirements.

The RX offers three important advantages:

**PERFORMANCE**—A flat power curve makes it a non-overloading unit, permitting the use of a single smaller-capacity motor for varying appli-



cations, and availability of the unit in sizes heretofore too large for direct drive applications.

**CONSTRUCTION**—A vertical center panel divides the unit longitudinally and supports the motor at its center of gravity. Resilient motor and fan mountings minimize noise and vibration. Result is quiet performance, and easy assembly and service.

**ECONOMY**—The basic design permits size reductions of as much as 36 per cent in the cubic dimensions of the unit, without sacrifice of performance. Thus, the RX is a thinner, more compact unit that can be fitted into tighter areas without choking of air intakes.

The design and performance of the RX give it a versatility that is of special importance to design engineers of air moving equipment. Full specifications are available.

## THE TORRINGTON MANUFACTURING COMPANY

TORRINGTON, CONNECTICUT • VAN NUYS, CALIFORNIA • OAKVILLE, ONTARIO



## Preview

## Manufacturers Will Spotlight Initial Showing of 1958 Air Conditioning Units

On this and others pages of this issue the NEWS is presenting a "preview" of air conditioning equipment exhibits scheduled for the 10th Air Conditioning and Refrigeration Industry Exposition. Readers are afforded the opportunity to spot various displays which they may find interesting. Preview of commercial refrigeration equipment appeared in the Oct. 28 issue, and the final preview, on parts and supplies, will appear in the Nov. 11 issue of the NEWS.

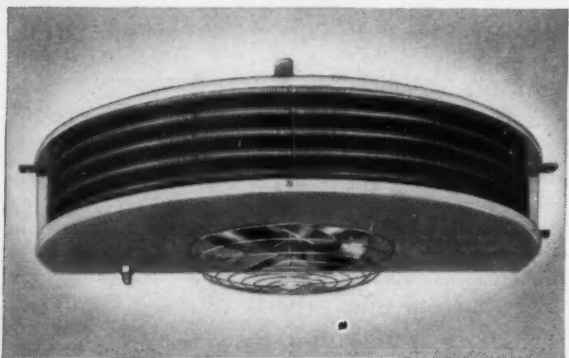
### Debuts Acid Inhibitor To Lead Condensers

New "Vapco-Hib" acid inhibitor made by Garman Co., Inc. will debut in booth 724.

Not an acid, it is claimed Vapco-Hib makes possible use of inexpensive strong rapid acting acids for descaling operations with complete safety. Demonstrations of this new product will be held daily in the display.

"Dricon" air condensers will hold the spotlight in booths 116-117 sponsored by Recold Corp.

Also, the company announced "Dri-Fan" evaporative condensers, "Vapomatic" low temperature coils, water defrost low temperature coils, and "Delta" and "Supreme" high temperature coils will be on display.



Sizes ranging from 360 to 1075 BTU.

## new from KRACK semi-circular unit cooler

Exclusive circuiting system prevents coil "frost-up"

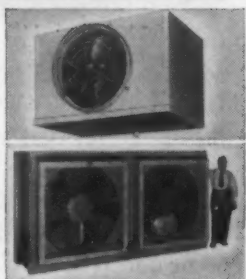
- \* Air intake is at the bottom—discharge is through coils in 180° arc.
- \* Electrostatic air filter on air intake.
- \* Mounts against wall—gives you more usable storage room.
- \* Semi-circular discharge provides more even air distribution and circulation in the cooler.
- \* Has full size built-in heat exchanger.
- \* Easier to install—suction and liquid line can be taken from either side of the unit.
- \* Drain pan is hinged for easy access to motor and expansion valve.
- \* Permanently lubricated motor with overload protection.

New Bulletin SC-957 gives complete data... write or 'phone today!

See this and other Krack cooling units  
in **BOOTH 401** at the  
Air-Conditioning & Refrigeration Industries 10th Exposition

New "BUC" Series  
moderate price ceiling mount  
unit coolers—265 to 1400 BTU.  
Bulletin BUC-457

KRACK air-cooled condensers  
up to 50 tons.  
Bulletin AC-457



Only Krack's 25 years of engineering and production experience makes such cooling values possible.



**REFRIGERATION**  
APPLIANCES, INC.

901 W. Lake St.  
Chicago 7, Ill.  
MOncroe 6-1141

### Headlines Thermostat

General Controls Co. will feature electric clock heating-cooling thermostat, differential pressure control for heat pump uses, large tonnage thermostatic expansion valve with removable power element, and water regulating valve in booths 626-627.

Other items to be displayed are: automatic controls for commercial refrigeration and residential, commercial, industrial, and auto air conditioners; room thermostats; thermostatic expansion valves; solenoid valves; control panels; refrigerant distributors; strainers; relays; motor starters; and accessory controls.

### 3-Way Solenoid Due

Three-way solenoid valve for control of fan-coil unit water flow in year-round air conditioners will be focal point of eyes in Jackes-Evans Mfg. Co., Controls Div. booth 259.

Also solenoid valves for refrigerants, water, air, light oil, brines, and many other fluids will be exhibited.

### Has Scale Preventer

Stiles Karlsonite Corp. will offer in booth 329 new Karlsonite water conditioner, with related chemicals, which prevents formation of scale deposits in cooling towers, condensers, heat exchangers, and similar equipment, the firm announced.

In addition, formula F711, a solid, crystalline material for scale, silica, and algae removal from all forms of refrigeration and air conditioning equipment, boilers, heat exchangers, etc., will be shown, as well as Karlsonite algicide, the company added.

### Truck Cab Cooler Set

D. W. Onan & Sons, Inc. will feature new truck cab air conditioners in booth 712. Other items of interest will be Onan engine compressors for air conditioning and refrigeration, it was noted.

### To Spotlight Motors

Items to be set up in Fasco Industries, Inc.'s booth 554 to capture attention include new No. 51 frame motor, a six-pole shaded-pole motor 5 in. in diameter with horsepower ranging from 1/80 to 1/4, it was stated. The motor is well adapted to air conditioning applications, according to the company.

Other units to be exhibited are: a complete line of shaded-pole and permanent split capacitor motors; and a full line of centrifugal blowers from 15 to 320 c.f.m.; and the "Fascostat," thermal overload protector.

### Offers Algae Control

Chemical Solvent Co. in booth 263 will spotlight a new 10-lb. package of CSCO special algae control in granular form. It is for use in air wash systems, cooling towers, spray ponds, evaporative coolers, and condensers.

### Shows 3-Way Regulator

Refrigerating Specialties Co. will exhibit in booth 411 a 1 1/2-in. three-way condensing water regulator intended for condensing pressure control of water-cooled condensing units or packaged air conditioners using a cooling tower, it was stated.

A full-sized working model of this regulator will be operating on a simulated cooling tower and condenser system with pump. Another display will feature a working control valve system for hot gas defrost of ammonia evaporators. This will include sequence timer, liquid line solenoid valve, hot gas solenoid valve, and combination defrost pressure regulator and suction shutoff.

In addition, the full line of R-S solenoid valves, back pressure regulators, and condensing water

regulators will be shown including many valve cutaway models, it was explained.

### Highlights Thermostat

Highlighted in White-Rodgers Co. booths 714-716 will be new pushbutton thermostat for year-round air conditioning, air conditioning control panels of one and two-piece, and new ice bank control, the company said.

Also on display will be "Fashion" thermostat for cooling use, a complete line of temperature and pressure controls for air conditioning and refrigeration, and line voltage thermostats in new "silver-beige" finish.

### Motor-Compressors Due

Bendix-Westinghouse Automotive Air Brake Co., Evansville Div. will exhibit a complete new line of motor-compressors and condensing units in booth 414.

Both semi-hermetic motor-compressors and condensing units, air and water cooled, in integral sizes from 1 1/2 through 7 1/2 hp. for high and low temperature applications will be on display. Facilities also will be available for wholesalers and OEM people to sit down and discuss application problems or unit requirements.

Another display will be some new high-speed motor-compressors for air conditioning applications. Full hermetic condensing units will be shown too.

### To Eye Mobile Cooler

Keco Industries, Inc. will exhibit one of its large mobile air conditioners in booth 354. An 18-ton unit, it was designed for the Air Force.

Model G-18E is electric driven, but Keco also produces a gasoline engine driven version of the item which has the major function of simulating weather to permit accurate calibration of aircraft electronic equipment and controls, it was explained.

### Spotlights Condensers

F5 Air Conditioning Corp. will spotlight air-cooled condensers in booth 315. In addition, the firm will introduce a completely new 3-ton semi-packaged cooler adaptable to service station and other small building installation, it was stated.

"Fandaire" air-cooled condenser offers circular sloped tube design permitting 100% counterflow and tube drainage, eliminating dead spots, it was explained.

### Will Exhibit Line

Marlo Coil Co. will display representative equipment from its line of air conditioning and heat transfer products in booth 705-707.

Included will be an air-cooled condenser, new horizontal evaporative condenser of blow-through type, 5-ton cooling tower, remote room air conditioning cabinet and recessed units, a unit cooler, air handling units for split systems, and a 3-ton duct coil for residential uses.

### Features Cooling Line

Spanning six entire show spaces—booths 105 through 110—Air-temp Div., Chrysler Corp. will sponsor a major display of air conditioning equipment featuring many of its 130 residential and commercial air conditioning products.

An air-cooled packaged commercial line recently marketed will be highlighted along with a new series of winter air conditioners. Room air conditioners for 1958 and several year-round residential systems, backdropped by larger units, will be included in the "Dial Springtime Anytime" presentation.

### Presents 4 Items

Kramer Trenton Co. will present for the first time four new developments claimed to be of special interest to air conditioning and

refrigeration contractors and wholesalers in booths 439-440-441.

A display covering a wide range of heat transfer surfaces for OEM people also will be shown. Technical data on this will be available. In addition, units covering the general line will be on hand.

The company also noted that a receptionist will be on duty at the booth.

### Features Furnaces

Latest type gas and oil-fired furnaces, including a cutaway of a gas-fired unit, together with cooling coils and condensing units which can be used for year-round home heating and cooling will be shown in spaces 758, 759, and 760 by Frigidaire Div., General Motors Corp.

Representative models of room air conditioners, residential, and commercial air conditioners will be presented also. Coil blowers, a 3-ton store air conditioner, and two automatic ice cube makers will be included.

The exhibit will have a redwood background and feature a full-length illuminated canopy.

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### Highlights Compressor

Highlighting Bell & Gossett Co.'s display in booths 525-526 will be a new reciprocating compressor and motor.

A complete line of circulating pumps for hot and chilled water systems, cooling towers, etc., will also be featured.

In addition, a full line of refrigeration components, a complete line of packaged liquid chillers, and a 40-ton package will be exhibited.

### To View Compressor

A cut-away "Eclipse" compressor, kept in slow motion by a special drive, to illustrate its line of multi-cylinder refrigerating machines, will be exhibited in booth 314 by Frick Co.

Frick will show for the first time a new ammonia compressor of 4% by 3% size. It has nine cylinders and a capacity equivalent to a 2-cylinder standard enclosed ammonia compressor.

A special evaporative condenser, with the fan placed at one side to save headroom and a new 5-hp. air conditioner will also be displayed.

Models will be on hand of "Prestfin" pipe coils and spiral-finned pipe, along with a display of valves and fittings, machine parts, controls, safety devices, and literature.

### To Center 'World'

Centerpiece of Carrier Corp. booth 510 will be "the world." Shaped like a Carrier oval, the world map will feature outlines of the continents done in wire over which will be pictured Carrier installations in the U. S. and elsewhere ranging from near the Arctic circle to the southern tips of South America and Africa, the company reported.

Process refrigeration and compression installations also will be depicted along with pictorial coverage showing trains, ships, buses, apartments, government buildings, plants, hotels, and other air conditioning installations.

Representative products will be shown in another part of the booth, including new 60-lb. portable room air conditioner, residential and commercial air conditioners, centrifugal and absorption machines and room apparatus for "Conduit Weathermaster" system.

### Offers Central Unit

Attention in booth 671 will be focused on a new 3½-hp. central hermetic residential air conditioning packaged unit, Southwest Mfg. Co. announced.

In addition, 2 and 3-hp. remote compressor condenser units, 100,000 B.t.u. upright gas-fired furnace

with 3-ton evaporator coil, and a 3-ton air handling unit will be shown.

### Introduces Valve Line

A new line of small expansion valves and new air conditioning controls will be headlined in Detroit Controls, Div. of American Radiator & Standard Sanitary Corp.'s Booths 557-609.

Also expansion valves, solenoids, and air conditioning controls will be featured.

### To Use Geiger Counter

A radioactive demonstration involving a Geiger counter and scaled-up condenser tubes will highlight Calgon Co.'s exhibit in booth 226.

Purpose of this demonstration by the division of Hagan Chemicals & Controls, Inc. is to point out the importance of proper water treatment in preventing scale in cooling tower systems, it was explained.

Three condenser tubes, subjected to identical services for the same length of time and using make-up

water of exact hardness and alkalinity will form the basis of the demonstration. One had no water treatment or bleed-off, one had bleed-off only, the third had both.

Rigged at a pre-determined time cycle, the Geiger counter will pass over each of the cutaway tubes, it was added. It will sound off when it passes over a tube with even the least trace of scale.

A waterless hand cleaner and gas leak detector will be displayed for the first time, the company said.

### To Headline Furnaces

Booth 174 will feature such new equipment as: "Rheemglas" glass-lined gas furnaces; "Riviera," "Meteor," and "Imperial" gas furnaces; oil and gas-fired heating boilers; 8-ton "Rheemaire" air conditioning system; room air conditioners; and commercial store air conditioning units, Rheem Mfg. Co. announced.

Other items to be exhibited are gas and oil-fired furnaces and 2, 3, and 5-ton air conditioning systems.

### Damper Control Eyed

New automatic blower damper control tied to a summer and winter switch on combination heating and air conditioning unit to eliminate changing of pulleys and two-speed motors will be featured in Morrison Products, Inc.'s display in booth 262, the company announced.

Complete blowers, direct-connected blowers, and blower parts and accessories will also be displayed.

### Residential Units Due

New 3-5-hp. remote residential air conditioning units and 2-3-ton "Tuckaway" units will be featured in Perfection Industries, division of Hupp Corp.'s booth 455, it was indicated.

In addition, Perfection will introduce its 70th anniversary gas furnace line for 1958 including "Regulaire," three-stage fire, and builder's models.

The 1958 oil furnace line will also be shown, it was further noted.

### Remote Heat Pump Set

High point of the Westinghouse Electric Corp. Air Conditioning Div. display will be a new remote heat pump, it was indicated.

Requiring no water, using only electricity and air, the two-section year-round unit has a new modular indoor section. It fits any closet, basement, utility room, attic, or crawl space. Reversible cycle is located in the outdoor section.

Other actual models will also be featured as well as scale models of the whole packaged and applied equipment line, it was noted.

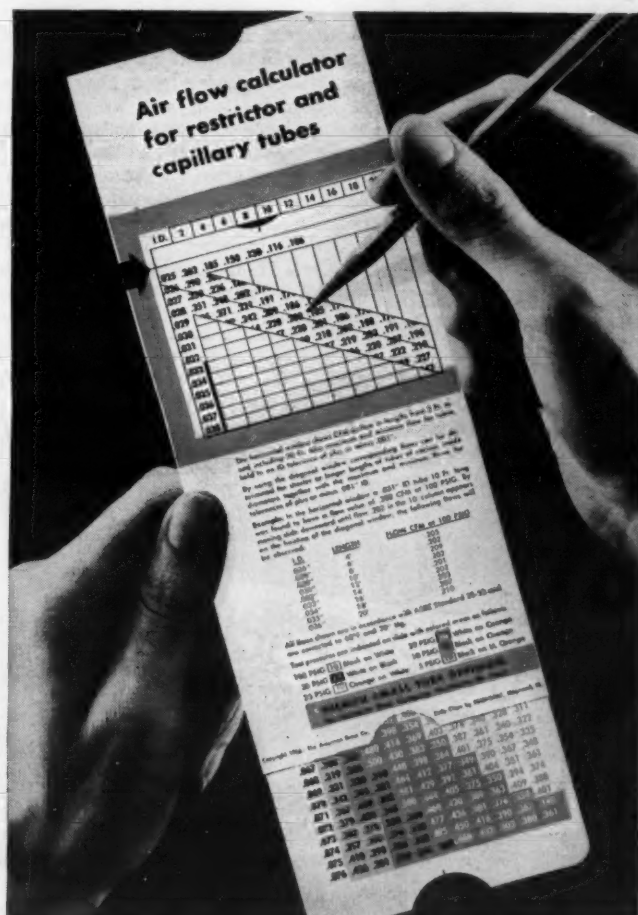
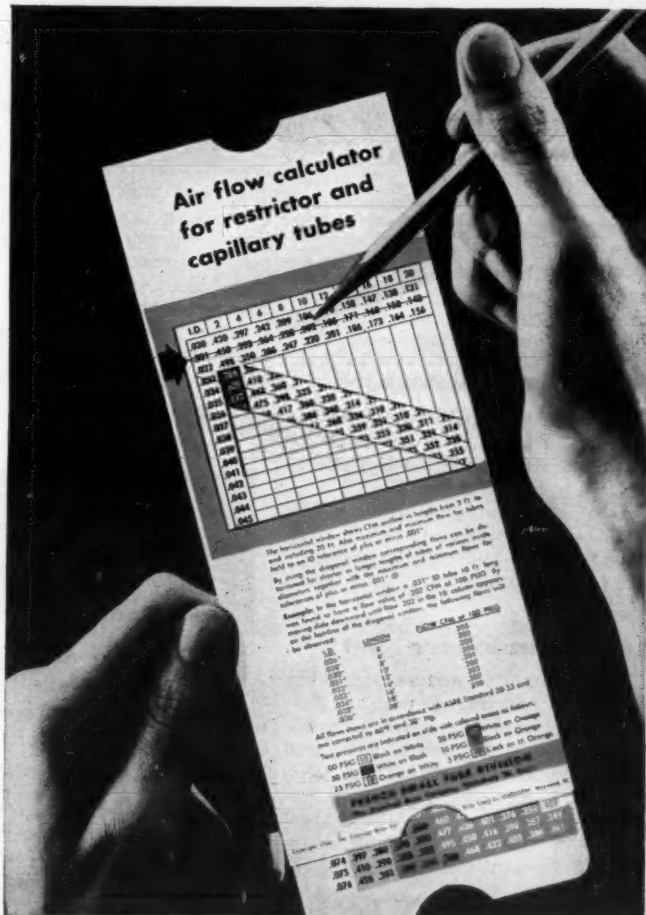
### Will Display Motors

Shaded-pole and permanent split-capacitor motors for air moving applications will be featured in Delco Products, Div. of General Motors Corp.'s booth 448.

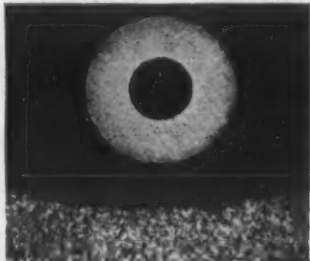
Other items to be displayed include: split-phase and capacitor-start fractional horsepower motors, single-phase and three-phase integral horsepower motors, gear motors, hermetic motors, and capacitors, relays, and contactors.

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A cross section of an Anaconda Copper Restrictor Tube, .081" O.D. x .031" I.D., magnified 10X. Note the roundness of the bore.



Section of a photomicrograph (200X magnification) to show smoothness of the bore.

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## Preview

## Attendants Will Be on Hand To Offer Demonstrations In Booth, Give Advice

### Offers Circular Coils

New circular coils, evaporators, and condensers for air conditioner and dehumidifier use will be headlined in booth 327 by Kirsch Co., Refrigeration Div.

The company says it also will show coils, heat transfer surfaces, evaporators, and condensers for refrigeration.

### Introduces Ducting

Flexible Tubing Corp.'s items of special interest in booth 511 will be "Thermafex," a new-type ducting for high and low-pressure air conditioning systems, the company said.

These units are constructed basically of a continuous galvanized spring steel helix covered with a permanently bonded three-ply laminate of glass fiber fabric between two layers of aluminum sheeting. They are claimed to be flexible, light, flameproof, and easy to install. They have 2 to 12-in. diameters.

Other items to be displayed: a complete line of ducting in diameters of 1/2 to 30 in. for air handling, fume removal, duct removal, and materials handling, it was pointed out.

### To Display Compressor

Main attraction at booth 136 will be a new 16-cylinder VMC compressor shown for the first time by Vilter Mfg. Co. It will be direct, connected to a 200-hp. motor mounted on a steel base, and will have all standard switches, gauges, and accessories. A cylinder head will be removed for inspection of pistons, gas ports, and replaceable filter liners.

Designed for "Freon" or ammonia, high stage or booster service, the new compressor is the biggest member of the VMC family. It is designed to replace duplex 8-cylinder VMC's delivering the same capacity in far less

space. The unit will operate at speeds up to 1,200 r.p.m.

### Features Cooling Units

A feature of National-U. S. Radiator Corp.'s "Capitolaire" air conditioning display in booths 269 and 271 will be announcement of the new CEN "Flexazone" air conditioning unit for use in all types of large commercial and industrial installations.

Entirely self-contained, this year-round air conditioning unit is designed to meet varying load conditions through controlled zone heating and cooling. It will be available in a complete range of sizes from 7 1/2 through 60 tons, according to the company.

Other products to be featured include a complete line of residential and commercial air conditioning units.

### Compressor Line Due

A new line of pancake-type compressors for household refrigerators and freezers will be featured showing of Tecumseh Products Co. in Booth 457.

Also highlighted will be a complete new line of internally spring-mounted compressors including high-speed units, 1958 air conditioning line, and new "Lowboy" auto air conditioning compressor.

Representative models of all Tecumseh equipment, both hermetic and open, with cutaways and operating models will be on display.

### To See Custom Filter

A custom-made "Dust-magnet" electrostatic filter for air conditioners will be center of attention in booth 652 of Stoddard Industries, Inc.

Other item to be shown will be model E Dust-magnet in 1-in. steel frame for central air conditioning and warm air heating units.

### Features Condensers

Booster condensers for combination air and water usage will be the feature of Standard Refrigeration Co.'s booth 563.

Also, the company indicated it would display shell-and-tube condensers, shell-and-coil condensers, counterflow condensers, and liquid receivers.

### Auto Condenser Set

An automotive air conditioning condenser fabricated with a flattened steel tubing serpentine made by Rochester Products Div. will be shown in booth 321 by this General Motors Corp. unit.

Various applications of GM steel tubing in the refrigeration market will be other items displayed.

### Offers Blower Wheels

Revcor, Inc. will center new double-inlet blower wheels in booth 719 at the show.

In addition, the firm announces it will display "Blastaire" blower wheels, blower wheel housings, and other blower wheel models.

### Condensing Units Due

A new line of air-cooled condensing units ranging from 2 to 20 tons' capacity will be highlighted in Typhoon Air Conditioning Co., division of Hupp Corp.'s booth 303.

Other items will include: an 8-ton packaged air conditioning unit; a 15-ton packaged unit; a 30-ton packaged unit; model TAS 21-31 "Economy" line; model TAR Economy line air-cooled condensing unit; model H-66 high side; and model 5 LSU low side.

### Leads Coil Surface

Peerless of America, Inc. will lead with a new coil surface, "Universal-K," used for both evaporator and condenser air conditioning coils and adaptable to auto and window air conditioners and household central systems in booth 322. The coil is wound in different shapes to meet specific applica-

tions. Also, a "U-K" baseboard heating surface will be featured.

Other items: pie plate coils, power pack units; twin-power pack units; flash coolers; cube makers; flash plates; display case coils; beverage cooler coils; and vending machine coils.

### To Feature Filters

Owens-Corning Fiberglas Corp. will feature in booth 726 its "Golden Dust-Stop" and "U-Trim-It" air filters, filter media and adapter unit, and prefabricated duct.

Also to be shown are: low-pressure pipe insulation; standard pipe insulation; white dual temperature pipe insulation; duct insulations; and low temperature insulations, it was added.

### Shows Cooling Line

A complete line of air conditioning equipment in conjunction with heating equipment will be displayed in booth 366 by Permaglas Div., A. O. Smith Corp.

### Expanded Line Eyed

Lehigh Mfg. Co. indicates it will spotlight a new expanded line of hermetic condensing units from 1/2 through 2 hp. and new airframe type bases for the 1 1/2 through 3-hp. open-type condensing units in booths 156-158.

Standard line of open-type condensing units from 1/4 through 5 hp. will also be on display, it was stated.

### To Highlight Motors

Marco Industries, Inc. announced it will highlight permanent split-capacitor motors for air moving devices in booth 253. Also headlined will be shaded-pole, split-phase, small diameter pancake type, and direct-drive fan and blower motors.

Other items to be shown include conventional line of fractional horsepower motors, it was pointed out.

### Home Thermostats Set

New line of residential heating-cooling thermostats, RAC panels, and pressure controls will be headlined in Minneapolis - Honeywell Regulator Co.'s booth 561.

Other items displayed are existing panels, existing thermostats.

### To Spotlight 10 Items

McQuay, Inc. reports it will feature 10 new products in booth 501.

Included are: a 30-ton air-cooled condenser; 3,400 B.t.u. "Pace-maker" unit cooler; 1,050 B.t.u. radial unit cooler; radial unit coolers with aluminum cabinets; 220 and 300 B.t.u. two-way unit coolers; large capacity ceiling and "hideaway" "Seasonmakers"; a working model of automatic hot gas defrost system; 7 1/2-ton vertical and horizontal residential evaporators; 7 1/2-ton air-cooled condenser with centrifugal fan; and floor mounted product cooler.

Along with that, two-way unit coolers, floor and more "hideaway" Seasonmaker air conditioners will be shown.

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## Preview

# Attention To Be Drawn to New Products Being Debuted at Industry Exposition

## 2 Items of Interest

Curtis Mfg. Co., Refrigeration Div. reports new equipment of special interest to booths 559-607 visitors will be a 5-ton packaged air conditioner and a 10-ton packaged liquid chiller.

Other items to be displayed include: various condensing units; 5-ton residential air-cooled condensing unit; and furnace bonnet type cooling coil.

## To Eye Central Units

Mitchell Mfg. Co.'s new "low-cost" line of commercial and residential central air conditioners, air and water-cooled up to 7½ hp., will be featured in booth 422, according to this division of Cory Corp.

Air-cooled remote air conditioning, 2 to 7½-hp. self-contained pre-wired air-cooled residential and commercial air conditioners, and blower-evaporator coils will also be shown.

## Features Room Unit

Booths 611-612 of Addison Products Co. will headline a new portable room air conditioner, newly-designed condensing units, and newly-designed dehumidifiers, the company said.

Other items to be displayed include a complete line of central air conditioning units.

## To Spotlight Chillers

American Coils Co. announced the spotlight in booths 663, 664, 665 will shine on new 3 to 15-hp. air-cooled packaged chillers, 2 to 7½-hp. remote air conditioners, and ceiling mounted air conditioning units, 2 to 7½ hp.

Other new items to be exhibited are 3-15-hp. water-cooled packaged condensing units, 3-15-hp. air-cooled packaged condensing units, and 2-7½-hp. air-cooled condensers.

Other units to be shown include: water-cooled air conditioners; air-cooled units with remote condensers; packaged chiller; packaged chiller with remote condenser; two cooling tower lines; and a water-to-air heat pump.

## Home Units To Be Seen

Booth 409's highlight for the show will be Bryant Mfg. Co.'s line of residential heating, air conditioning, and water heating equipment, according to the firm.

## To Display 'Polar-Pak'

Model 6211 2-hp. "Polar-Pak" air conditioner will be the feature of Coleman Co., Inc.'s booth 320, the company announced.

Also to be shown is model 2702 100,000 B.t.u. input "Trim Boy" furnace, it was added.

## Tower To Be Viewed

Booths 346-352 will highlight completely new and redesigned copper deck cooling tower and air-cooled condensers, according to Dunham-Bush, Inc.

In addition, a completely pre-engineered commercial packaged air conditioner of 10 to 40 tons' capacity, a new unit cooler type unit for reach-in refrigerators, new oblong pre-mix cast cooler, and new cleanable tube condenser will capture visitors' eyes, it was stated.

Other items to be shown include: an air-cooled residential package chiller; special coils for various applications in aviation and electronic cooling; hot water and steam specialties; a full line of commercial refrigeration units; air conditioning units; and liquid coolers.

## 'Ultra-Small' Unit Due

Emerson-Quiet Kool Corp. will feature a new "ultra-small" portable air conditioner among other items in booth 442.

New products to be shown in addition include a large-capacity small air conditioner, through-the-wall heating and cooling unit, and a through-the-wall air conditioner.

The firm also said it will show "Tru-Slim" room air conditioner, "Deluxe" room unit, a "Super Dynamic" room air conditioner, and an attic unit.

## Displays Heat Pumps

Visitors will eye new 2, 3, 5, and 10-ton air-to-air self-contained and remote heat pumps in General Air Conditioning Corp.'s booth 266, the company indicated.

## Offers Split Systems

New split system air conditioners with remote condensing units in 3, 4, and 5-ton capacities with evaporator-blower units suitable for mounting within or outside of conditioned space will be headlined in General Electric Co.'s Air

Conditioning Div. booth 932.

Other new items of interest, G-E said, will be packaged water-cooled air conditioners in 20, 25, and 30-ton capacities for commercial and industrial applications.

Also on display will be an operating model of a standard pressure-type water cooler and a "Hot and Cold" bottle-type water cooler with refrigerated compartment for use in stores, offices, and factories.

## Headlines 3 Items

New heat pumps, 2½-hp. window air conditioners, and window units with electronic filters will be featured in Loneragan Coolerator Div., McGraw-Edison Co.'s booth 403, the company said.

Portable humidifiers will also be exhibited.

## Features 'Climate Van'

Worthington Corp. will feature its "Climate Van" in booths 123, 124, and 126 at the exposition, it was announced.

Also "Flexi-Cool" packaged air conditioners and gas and oil-fired furnaces will be shown.

## Focuses on New Items

New items to focus attention on in Madden Brass Products Co.'s booth 655 are "Multi-Can" charging kit designed for auto air conditioning service work, charging and testing manifold, strainer-capillary combination, and quick-coupler charging line, the company said.

Other equipment to be displayed include: hermetic port valves; tube piercing valves; refrigerant can piercing valves; flare fittings; brass pipe fittings; strainers; driers; and tube working tools, the company said.

## Spotlights 4 Units

Four new items will be spotlighted in Mueller Climatrol, division of Worthington Corp.'s booth 506, it was announced.

They are: type 915 air-cooled summer air conditioner; type 917 air-handling unit; type 918 remote air-cooled condensing unit; and type 62/63 fan coil units.

Other items on display will be type 920 recessed room conditioner and other packaged air conditioning units.



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## Contractor A 'Most Important' Factor In Future Success of Residential Air Conditioning as End of Product Pipeline

(Continued from Page 1) the sales fell somewhat short of pre-season estimates. (And during the past two seasons many contractors have bemoaned the "profitless prosperity" that seemed to prevail.)

### 'Can't Control Outdoor Climate'

Without doubt, prolonged spells of exceptionally hot weather over most of the country would solve the problem of sales, and profits too, but while the air conditioning industry can manufacture indoor climate to meet every need and desire, it can't control outdoor conditions.

It would appear, therefore, that other steps may be required to insure continued and

healthy growth of this industry.

It may well be that the residential air conditioning industry is simply passing through an evolutionary period and that everything will work out all right in the end, just as many "impossible" adolescent children develop into fine, responsible adults. Judging by the popular press, though, there seems to be an increasing number of juvenile delinquents for whom somehow things didn't work out all right.

The contractor or dealer—the final link in the chain of distribution from the manufacturer to consumer—is a most important factor in the future success of the residential air conditioning industry. Obviously, there

have to be manufacturers to produce the necessary equipment, but someone has to sell the product lest the pipelines of distribution become chockfull and back up, as they have in some instances this past season. That "someone" is the contractor.

### Responsibilities of Contractor

The contractor has responsibilities besides selling, it must be recognized. Sell he must, but he also has to install well and perform service—at a profit. The best equipment from the factory will give poor satisfaction if not properly applied and installed. And sometimes the contractor can make a less than perfect piece of equipment perform satisfactorily in the field.

Not all contractors, it will be admitted, can do a good sales job and/or a good job of installing and servicing equipment, but these must be done if the residential air conditioning is to grow and prosper.

Perhaps somewhat in the natural order of things, the residential air conditioning placed initial emphasis on design and engineering of equipment. And because everyone clamored for air conditioning three or four years ago, or so it seemed, there wasn't much necessity for the individual dealer to make an all-out selling effort.

Manufacturers soon discovered that one of their major problems was to insure proper installations by contractors, not all of whom then knew what a proper installation should be, and some of whom apparently didn't much care. Some contend that this situation hasn't improved radically in the past two or three years. In fact, there are

contractors who swear things are getting worse.

In part, this may be due to some contractors having a lot to learn yet as to what constitutes a good installation. Others probably know better but find it easier to cut corners (and quality) to meet competitive prices.

### 'No Need for Expensive System'

This is not to imply that a good installation must be expensive. Satisfactory comfort cooling and heating can be obtained in the home with less than the most elaborate and expensive system.

Contractors, too, can make a reasonable profit on moderate priced systems that are well engineered and installed. But they can likewise lose their shirt if the original selling price is too low, or if expenses get out of hand.

If too many shirts continue to be lost or get pretty well torn up at the contracting level, then the industry's "growing pains" may well go on indefinitely.

### 'Has Lot To Learn'

Turning now to the 19 "case histories" of the Fort Worth contractor, this contractor will be the first to admit he has a lot to learn about making a profit in residential air conditioning.

(His name is being withheld for a variety of reasons, none of which concern the validity or authenticity of the "case histories" in question.)

In fact, it will be shown that this contractor actually lost some money over-all on these 19 jobs. He hopes and expects to correct this situation in the near future without resorting to shortcuts or lowering the quality of his installations.

### Range of Prices for Jobs

A wide range of prices—\$800 to \$2,552—is represented in these 19 installations, all of which are good, plain systems without fancy frills. All the jobs are in existing homes. Some are "add-on" installations; some involve adding cooling and replacing the furnace on existing ductwork; a few involve cooling and heating equipment and complete ductwork installation.

Data given in the 19 case histories includes a detailed listing of all the equipment and materials than went into each job, all the direct costs, a brief description of the job, a few notes on how the sale was made, and the service record at the time of checking (late September).

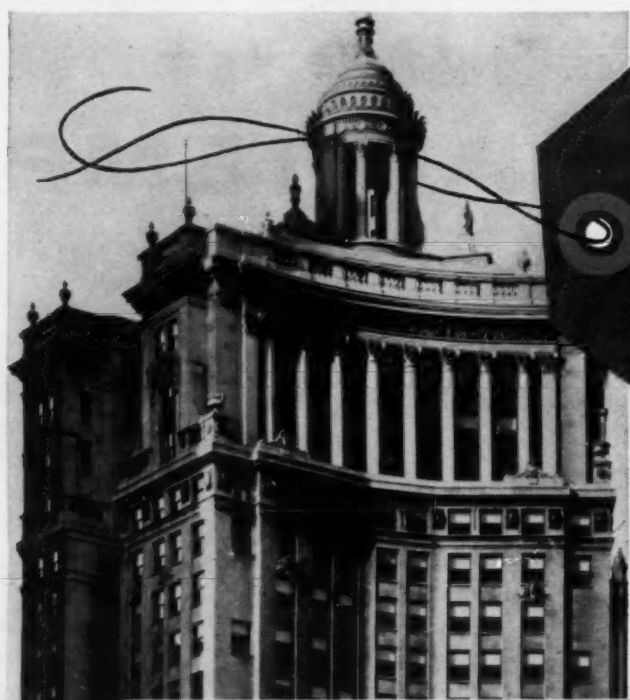
This contractor operates a union shop and pays a labor rate of \$3.32½ an hour. Ductwork and wiring are sublet. The contractor has good reason to believe, he says, that the ductwork charges are at cost and that the electrician is working merely for wages. Therefore, it would appear there is no hidden profit in these jobs.

### Prices Generally Competitive

His prices were generally competitive, but in some cases they ran comparatively high.

Close scrutiny of some of the case histories will reveal errors in arithmetic and possibly omissions of some items of cost. No effort was made to "doctor" these records. They're published

(Continued on next page)



Trane's air-conditioning system in the London Guarantee Building, Chicago, uses Allen-Bradley solenoid motor control.

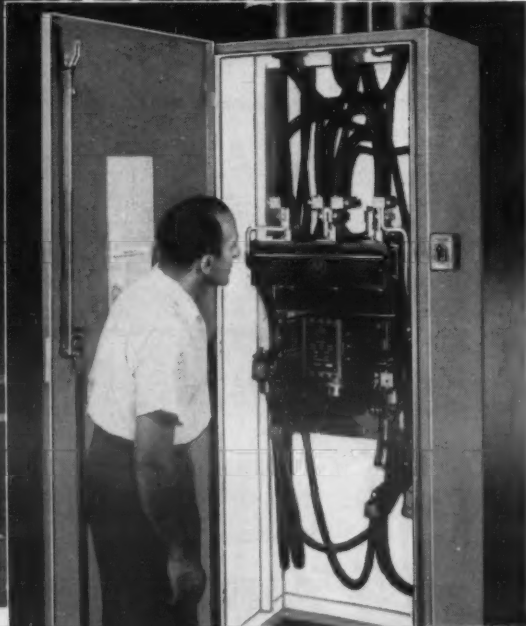
Manufacturers of large air-conditioning and refrigeration systems realize that the reliability of their system and the reliability of the motor control used are identical—for all practical considerations. That's why the Allen-Bradley trademark—the sign of quality motor control—is so frequently seen on important jobs.

The simple solenoid starter design—exclusive with Allen-Bradley in all sizes up through Size 7—has only one moving part. This is your assurance of millions of trouble free operations. There are no bearings to corrode and stick... no flexible jumpers to wear and break. Also, the double break, silver alloy contacts—used throughout the Allen-Bradley line—never need cleaning, filing, or dressing. Downtime for contact maintenance is eliminated... and so are "service calls." You can install Allen-Bradley motor control... and forget it.

A decision you'll never regret—to standardize on Allen-Bradley motor control. Its proven reliability costs you no more. The Allen-Bradley trademark is universally accepted.

Please write for your copy of the latest Allen-Bradley Handy Catalog... the 132-page guide to trouble free a-c and d-c motor control.

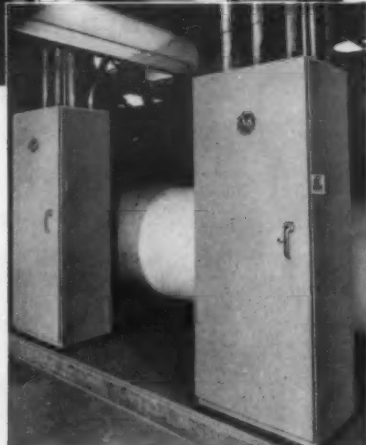
Allen-Bradley Co., 1313 S. First St., Milwaukee 4, Wis.  
In Canada—Allen-Bradley Canada Ltd., Galt, Ont.



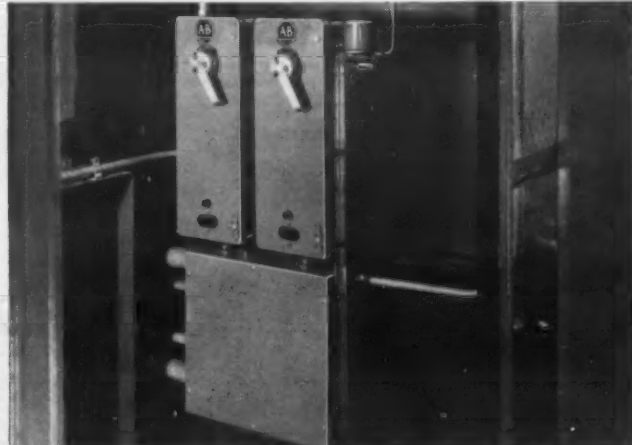
One of the Bulletin 709 Size 7 across-the-line starters used with the 250 hp, 208 v pump motors.



THE SIGN OF  
QUALITY  
MOTOR CONTROL



● The two Bulletin 709 Size 7 across-the-line starters for parallel pumps. Single or dual operation. Alternate starting is also provided.



● Zone air handling units are mounted on each floor in the elevator shaft. A set of two Bulletin 712 Size O combination starters—one for each intake and exhaust motor—are used with each of the 19 units in the building.

For more information about products advertised on this page use Information Center, page 26.



## 19 Residential Job Histories --

(Continued from preceding page) here with exactly the same amounts listed in the contractor's job folders. (Actual names and addresses are in this reporter's files.)

### Authentic Case Histories

Some rearrangement of the listings has been made to simplify comparisons of materials used and costs, but nothing has been added to, or subtracted from, the records to make them look better or "come out even." In other words, the case histories are as authentic as photostatic copies but much easier to read and study.

Possibly one of the first things that will be noted in studying the records of these 19 jobs is that three different makes of condensing units appear and that the cost of the three varies considerably for the same nominal horsepower.

While dollars per nominal horsepower is an important consideration in selecting equipment, of course, this contractor points out there are several other factors which shouldn't be ignored, such as dollars per delivered B.t.u., ease of installation, amount of service, etc.

### Cost Variation

As would be expected in a study of air conditioning installations in existing homes, there is considerable variation in the material, direct labor, and ductwork costs, and to a lesser extent, wiring costs from job to job because no two jobs are exactly alike. This is fully illustrated in the accompanying 19 case histories.

Because of these differences in house construction, etc., it would be unwise to make too many generalizations on the basis of just these 19 jobs. Some observations can be made, but these probably should be checked against numerous other jobs before arriving at firm conclusions.

### 'Close Correlation Between Material, Labor Costs'

For example, there would seem to be a fairly close correlation between material costs and direct labor (and ductwork charges) on these installations, which shouldn't be surprising. In other words, the more materials required, the more labor will be needed to get them installed and hooked up.

One of the controlling costs of the total amount required for materials seems to be length of run of copper tubing. All the air-cooled condensing units on these 19 jobs are remotely located. Some jobs require that the condensing unit be located farther from the coil and the air-handling unit than others do.

### Tubing Runs, Costs

In connection with tubing runs and costs, attention should be called to Case Histories 3, 6, and 16, which employ pre-charged tubing. These three jobs are characterized by low direct labor costs while the cost of materials remains more or less in line over-all with the other jobs.

At first thought it might seem that pre-charged lines would permit a sharp reduction

in labor costs on all jobs. Theoretically, they might do that, but unfortunately, the contractor explains, pre-charged lines don't lend themselves equally well to all installations.

For one thing, the length of these pre-charged lines is arbitrarily pre-set—in these three cases at 40 ft. If the run has to be longer than 40 ft., then conventional tubing has to be used.

If the run is somewhat shorter than 40 ft., what is to be done with the excess length of pre-charged tubing?

Because pre-charged tubing is fitted with hand valves, large openings must be provided in the house to get such an assembly through the walls to the low side of the system. Such larger openings are not always desirable.

This contractor also points

out that many applications do not permit the condensing unit and/or coil to be oriented in such a way to allow an easy connection to be made between the pre-charged line and the equipment.

### 'Takes 2 To Handle Pre-Charged Tubing'

Still another point to consider, he says, is that it usually takes two men to straighten out and otherwise handle the pre-charged tubing, which is shipped in a roll measuring about 5 ft. in diameter.

With one obvious exception, the sublet charges for ductwork (which include no profit, the contractor says) are not far out of line with the selling price of each job.

The exception is Case History No. 18, which wound up with the smallest gross profit—2.2%—even though it was the next to the highest priced of the 19

jobs detailed here. Ductwork charges on this job were \$844.79, better than one-third of the selling price.

Problem in this case, the contractor says, was a "finicky" customer. This housewife sat in the attic all day watching the workmen install the ducts, and this constant "looking over the shoulder" naturally slowed the employees down considerably. There were also "extras" which had to be provided, and these added a lot to the costs.

Possibly the most important observation that can be made of these 19 jobs is that it would appear quite difficult to cut costs of materials and equipment much more, assuming, as it ought to be assumed, that quality systems are to be installed.

This thinking, it should be emphasized, is in connection with jobs in existing homes, which constitute the largest and conceivably most profitable market for residential air condition-

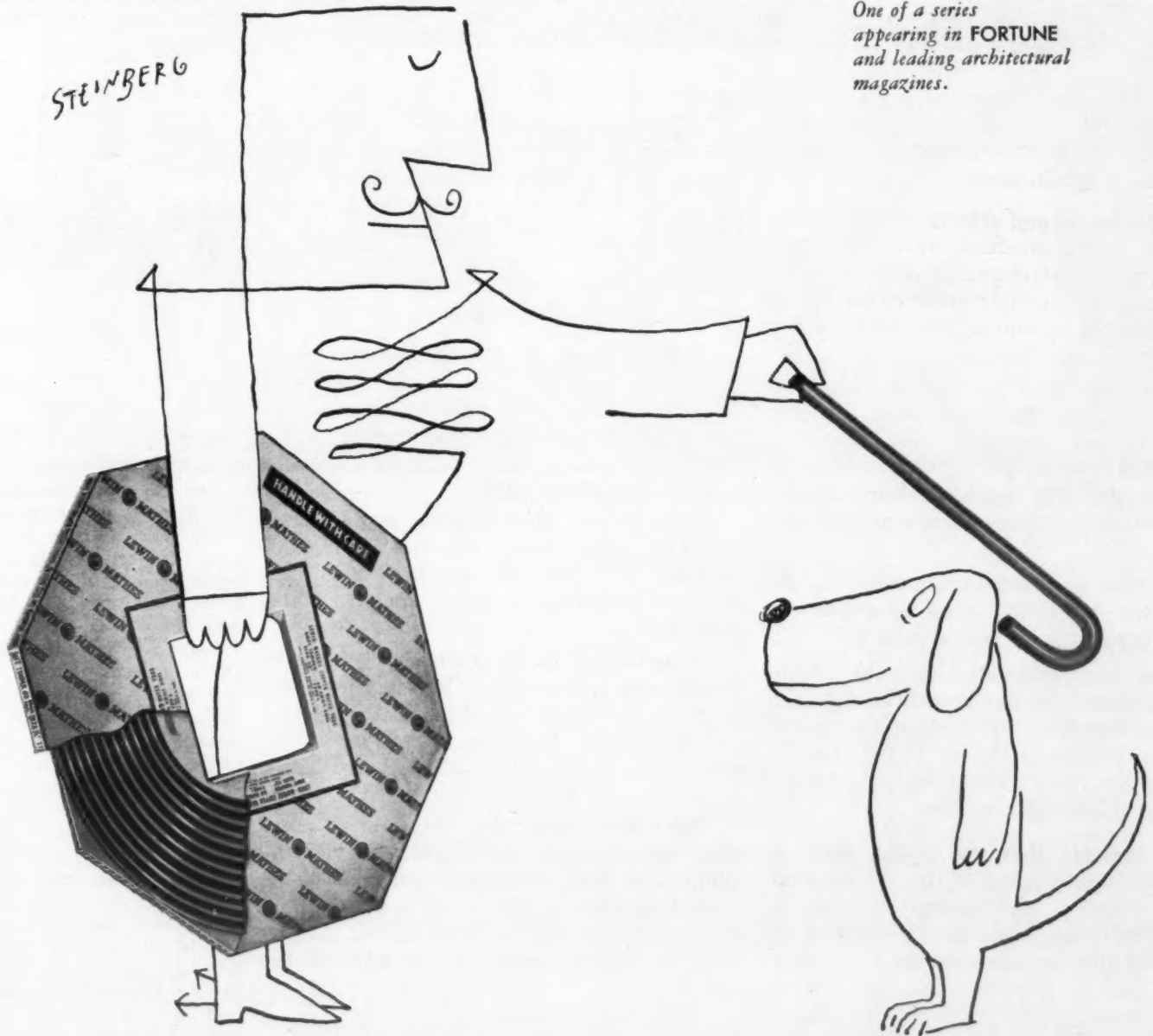
ing, it is generally agreed.

True, an exceptionally well constructed and well insulated and well oriented house might be air conditioned with a smaller system which would cost less. But if everything adds up to the need for a 3-hp. system, the less expensive 2-hp. installation will not give lasting satisfaction.

### 'Price Reduction Seems Unlikely'

It hardly seems in the cards that there could be much further reduction in price in the basic equipment needed for residential air conditioning. Perhaps some is possible, but cost of materials that go into the manufacture of such units is not likely to drop markedly in the near future, and labor rates aren't likely to be reduced either at the manufacturing level or at the installing level.

(Continued on page 17)



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### "NEOPHYTE SALESMAN IS DANGEROUS WEAPON . . ."

White Refrigeration  
Supply, Inc.

Des Moines 14, Iowa

Editor:

The Westinghouse ad in the Oct. 7 issue of the News reads, "Will more Edsels be sold in 1958 than central air conditioning systems?" This seems and sounds improbable, but let's read on.

Personally, I think the neophyte salesman is a dangerous weapon to aim at prospective buyers, especially if the distributor or dealer is interested in legitimate profits.

We have either forgotten or we never knew how to sell people who are actually interested in buying central air conditioning, ones that can afford the better things in life, such as comfort, cleaner homes, and best of all "pride of ownership." Remembrance of the 30's recalls to my mind that salesmen of that period did sell Cadillacs and Packards, even at the depths of the great depression. HOW? By qualifying the pros-

pect ahead of the appointment, eliminating 2 hours of the cheapest thing on earth, CONVERSATION, by determining whether the prospect had the dough for the down payment or for a cash deal.

Visit almost any car showroom today, Mr. Taubeneck, you know what you will find, 4 or 5 salesmen, most commonly known as order takers sitting on their big abstracts waiting for some buyer to show, so they can tell him what a lousy price his trade-in will bring.

TRADE-IN, that's the word missing in central air conditioning, but still we sit in our place of business, waiting, waiting, waiting for what? Bankruptcy? It's not a tough route to follow presently, and I'll bet it will be easier in 1958. Central air conditioning has an enormous potential, there is more money in banks and under mattresses than there ever was in 1932.

So what are we waiting for, another war?

B. F. Wood

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## It's a Long Way To Tipperary— And Industry Standards are Far From Honest Realization, Too

NOBODY (even when "Macy's doesn't tell Gimbel's") is free from bias about advertising comparative claims and competitive values, it would seem.

Despite the dogged efforts of AIR CONDITIONING & REFRIGERATION NEWS and Air-Conditioning & Refrigeration Institute committees to establish STANDARDS for rating air conditioning products, the battle is far from over on all fronts.

George Jones and the ARI have set up the standards, but they're not in the policing business as yet, and little machinery is available for enforcement. (We do not mean to dismiss the ARI work as being inadequate. Actually ARI has made a magnificent effort.)

As a case in point of the troubles involved, Bill McGrath, chief engineer of Carrier Corp., calls to our attention:

"I was very interested in your Inside Dope note under the heading, Lord Kelvin's Law. I don't wish to detract from the timely story you presented there, but I believe there are two points about which a better impression might be obtained.

"You indicate that the 1/2-hp. Unit is virtually retired in favor of the 3/4, and that the sales of the 3/4 have sharply dropped in favor of the 1 hp. This is true insofar as the nominal size designations are concerned. However, to a considerable extent the B.t.u./hr. capacity may have been misstated by some advertisers.

"For example, referring to the ARI listing of capacity ratings you find numerous units that are called 3/4 which have capacities of 5,400 to 5,500 B.t.u./hr. There are even newer models not listed here which under the 3/4 label provide capacities of less than 5,000 B.t.u./hr.

"Likewise, one often will find so-called 1-hp. units rated at 7,900 and 8,000 B.t.u./hr."

In the older, more comfortable times, a 1/2-hp. unit could be expected to deliver 5,000 to 5,500 B.t.u./hr. and a 3/4 7,500 to 8,200 B.t.u./hr.

While some manufacturers still offer traditional capacity ratings in these nominal sizes, a few others among marketers of low-ampere models apparently just relabel the horsepower size—sometimes, it seems,

in a rather careless manner.

A ton is equivalent, practically, to 12,000 B.t.u./hr. The class of units under discussion covers a range of rating from 7,900 B.t.u./hr. up to roughly 10,000 B.t.u./hr. Unless a particular unit will produce in excess of 12,000 B.t.u./hr. at rating conditions, the 1-ton label should not be used, experts like McGrath believe.

"While I am on this subject, I might point out that the use of horsepower to designate room air conditioner sizes is completely indefensible, and is certainly confusing to the public and to the trade," this respected engineer adds.

"If a 3/4-hp. label can be applied to a range of units which may run from 5,000 to 8,200 B.t.u./hr. in capacity, then what possible significance does such a label possess?"

Moreover, if the air conditioning industry would stop advertising "horsepower," and identify air conditioners with "B.t.u./hr." (or honest to goodness "ton" labels) it would take an important step toward better understanding by the public and the trade.

That first important step already has been substantially accomplished, via the adoption of certified capacity ratings (which were instigated by NEWS editorials and subsequent Letters to the Editor, and effectuated by sterling work on the part of the ARI).

"B.t.u./hr.," unfortunately, is not a measurement easily recognized by the general public. Can we come up with a better designation?

If it becomes possible to eliminate these meaningless "horsepower" designations, we shall have made further progress. Moreover, "ton" is an unfortunate word, also.

Bill McGrath is right as rain.

A substantial number of high-thinking and right-minded people in our industry are with him.

And AIR CONDITIONING & REFRIGERATION NEWS, "the Conscience of the Industry" will continue prodding its clients (subscribers and advertisers) until the selling of air conditioning becomes a decent business of which we all can be proud.

America deserves that type of honesty and conscientiousness on the part of our industry.



## Contractor's Files Show --

(Continued from page 15)

Some reduction in the number of hours of labor (both direct and indirect) required to install a system are possible, this Fort Worth contractor believes, and he hopes to bring this about.

There are many in the industry, however, who believe that more emphasis should be placed on selling, selling at a price that should be commanded by residential air conditioning, instead of concentrating so much effort on getting prices (and costs) down to beat the lowest competitor.

### 'Better Prices, Lower Labor Costs'

That better prices have to be obtained, or that labor costs have to be cut, or both, would seem obvious, judging by these 19 case histories. This is pointed up in the accompanying table that summarizes prices, costs, gross profits, and mark-ups of the 19 jobs.

Here is shown that the overall totals of the 19 jobs add up to a total selling price of \$30,068.37 and a total direct cost of \$25,052.76, leaving a total gross profit of \$5,015.61. This figures out to a mark-up of 20% over costs.

### Figures 33 1/3 % Markup

Some contractors might be satisfied with a 20% mark-up, and this contractor would also, if it weren't for overhead. This contractor, and many others like him, figure they need a mark-up of 33 1/3% to make a profit in this business.

There are some small contractors in the field, especially the one-man operators, who assume they have no overhead, but overhead exists in every operation, small or large.

The small outfits who assume they have no overhead to worry about are often the ones who wonder why they can't pay their bills on time, or why they seem to keep getting further and further behind financially, or wonder why they went broke. Alas, too, some larger firms often ignore their true overhead costs and wind up in bankruptcy.

Several of the installations listed here are in safe territory with respect to mark-up. Case Histories 2, 6, 7, 9, 10, and 19 are above the magic 33 1/3% point. But this leaves 13 below the safe margin.

While it would be an ideal situation if every job wound up as profitable, this is an unrealistic hope, especially for the contractor engaged in the existing home field, because he never knows for sure what he'll run into when air conditioning an older house.

But if he is to make a satisfactory net profit during the course of a year, the gross profit on most jobs will have to be sufficiently high to offset those jobs where costs run more than expected.

### Service Records

The service records on these 19 case histories may also be of some interest. Too many conclusions shouldn't be drawn from these, however, because the sampling is quite limited. Also, the warranty periods on some jobs hadn't run out when

these records were checked.

This contractor, like most others in Fort Worth, offers a 90-day free labor warranty on both cooling and heating equipment. With a year-round installation, the customer gets free service in the first 90 days of cooling system operation and in the first 90 days of heating system operation.

### \$30-35 Warranty Charge

A warranty charge of \$35 was made on 18 of these jobs, and \$30 on one. This represents a total of \$660 for the 19 installations.

At the time these records were checked, service calls had been made on eight jobs at a total expense of approximately \$275. Thus it would seem that the warranty charges of \$35 and \$30 should be considered

adequate though not excessive.

What the total in-warranty service expense on these 19 jobs will amount to when all the 90-day warranty periods have been completed is purely a matter of conjecture, of course, but there could very well be fewer service calls on the later installations because of experience gained, this contractor believes.

For example, one of the makes of condensing units installed employed a pressure relief valve which, after it once had lifted, did not reseal properly. This resulted in loss of refrigerant and service calls.

When the difficulty was finally traced to this valve, the contractor replaced it with a fusible plug. He then proceeded to replace the relief valve with a fusible plug on other jobs using this same condensing unit before they were installed, thus avoiding service calls due to this particular problem.

## 19 Case Histories

### Price vs. Profits on 19 Residential Jobs

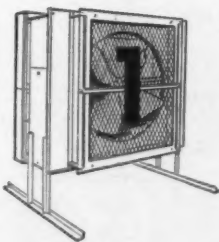
	Price	Direct Cost	Gross Profit	Actual Markup
Case No. 1	\$ 800.00	\$ 618.28	\$181.72	29.4%
Case No. 2	1,131.00	844.59	286.41	33.9%
Case No. 3	1,153.00	891.68	261.32	29.3%
Case No. 4	1,198.00	908.93	289.07	31.8%
Case No. 5	1,200.00	977.63	222.37	22.7%
Case No. 6	1,232.00	893.00	339.00	38.0%
Case No. 7	1,248.00	891.60	356.40	40.0%
Case No. 8	1,273.37	1,065.65	207.72	19.5%
Case No. 9	1,283.00	915.88	367.12	40.1%
Case No. 10	1,475.00	1,092.55	382.45	35.0%
Case No. 11	1,659.00	1,465.67	193.33	13.2%
Case No. 12	1,725.00	1,547.35	177.65	11.4%
Case No. 13	1,760.00	1,489.46	270.54	18.2%
Case No. 14	1,896.00	1,779.28	116.72	6.5%
Case No. 15	1,896.00	1,713.87	182.13	10.6%
Case No. 16	1,959.00	1,589.03	369.97	23.3%
Case No. 17	2,298.00	2,186.21	111.79	5.1%
Case No. 18	2,330.00	2,279.43	50.57	2.2%
Case No. 19	2,552.00	1,902.67	649.33	34.1%
Total	\$30,068.37	\$25,052.76	\$5,015.61	20.0%

(Continued on next page)

# ONLY KRAMER UNICON + WINTERSTAT\* GUARANTEES ALL

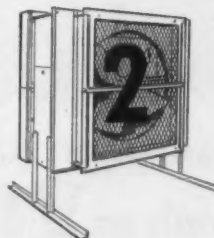
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### MAXIMUM LIQUID PRESSURE AT EXPANSION VALVE IN WINTERTIME



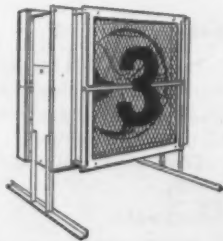
Only the Kramer UNICON plus WINTERSTAT guarantees the full refrigerant pressure at the expansion valve for full cooling capacity — even at below 0°F outdoors — automatically!

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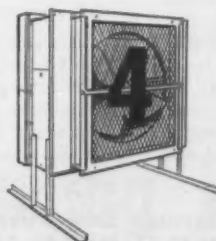
Only Kramer UNICON plus WINTERSTAT guarantees maximum condensing capacity in summer. In hot weather, the patented WINTERSTAT is out of the refrigerant circuit, permitting normal drainage from the condenser without restriction. This assures maximum condensing capacity in summer — automatically!

### PROMPT DEFROSTING AT ANY OUTDOOR TEMPERATURE



The use of UNICON plus WINTERSTAT makes Kramer THERMOBANK the only low temperature system that can guarantee operation and complete defrosting at any outdoor temperature—even 0°F or lower — automatically!

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Only Kramer UNICON plus WINTERSTAT (using modification #1) ensures positive and immediate compressor start-up with pressurestat operating the system, regardless of outdoor winter temperatures at the UNICON and regardless of length of compressor lay-off — automatically!

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For more information about products advertised on this page use Information Center, page 26.



## Job 1: Direct Labor 9% of Total Cost--

(Continued from preceding page)

### Case No. 1 \$800

Job. No. 5735: Add 3-ton air-cooled condensing unit to coil already in heating system of one-story ranch-type house. Owner to provide wiring. Ceiling to be insulated by owner.

This sale was made solely on price.

#### Equipment Cost

1 Holly ARV-38 3-ton air-cooled condensing unit...\$452.96

#### Materials

20 ft. 1/2 in. copper line..... 6.80  
20 ft. 3/4 in. copper line..... 2.80  
2 1/2 in. copper ell..... .34  
1 1/2 x 3/4 in. copper bushing..... .18  
1 1/2 in. sight glass..... 2.25  
1 drier ..... 5.60  
1 3-ton thermostatic expansion valve ..... 16.38  
10 ft. 1/2 in. galvanized pipe..... 1.60  
5 1/2 in. galvanized ell..... .80  
1 1/2 in. galvanized tee..... .24

#### Direct Labor

Sublet

Ductwork and concrete slab base for condensing unit.. 30.00

Warranty ..... 35.00

Total Direct Cost ..... 618.28

Gross Profit ..... 181.72

Selling Price .....\$800.00

#### Service Record

No service calls were reported during the 90-day guarantee period.

### Case No. 2 \$1,131

Job. No. 5714: Add 3-ton remote air-cooled condensing unit and oil to existing heating system in 1,200-sq. ft. house.

This sale was made solely on price.

#### Equipment

1 Holly ARV-38 3-ton air-cooled condensing unit...\$ 452.96

1 Holly 3-ton coil ..... 124.64

577.60

#### Materials

62 ft. 1 1/2 in. copper line .. 29.00  
60 ft. 3/4 in. copper line .. 8.31  
60 ft. pipe insulation ..... 13.20  
1 1/2 in. sight glass ..... 2.48  
2 1 1/2 x 90° copper ell..... .76  
2 ft. 1/2 in. copper pipe ..... .68  
1 1 1/2 in. copper coupling .. .25  
2 1 1/2 x 3/4 in. copper bushing ..... .74  
16 ft. 1/2 in. galvanized pipe ..... 2.56  
9 1/2 in. galvanized ell ..... 1.44  
1 1/2 in. galvanized union .. .43  
1 drier ..... 5.60  
2 1/2 in. flare nuts ..... .20  
2 1/2 in. flare nuts ..... .20  
1 1/2 in. flange ..... 1.00  
1 lb. silver solder ..... 1.00  
5 lbs. Refrigerant-22 ..... 3.25  
1 thermostat ..... 10.65  
1 thermostat sub-base ..... 2.00  
1 control panel ..... 6.84  
1 concrete base slab ..... 11.50

102.09

128.90

Warranty ..... 35.00

Permit ..... 1.00

Total Direct Cost ..... 844.59

Gross Profit ..... 286.41

Selling Price .....\$1,131.00

#### Service Record

No service calls were reported during the 90-day guarantee period. During July and August three service calls involving leaks were made. The customer was charged the following totals for the three calls:

13 lbs. of Refrigerant-22 ..\$ 13.92

Labor ..... 26.52

### Case No. 3 \$1,153

Job No. 5715: Add 3-ton air-cooled condensing unit and coil to existing heating system in 1,400-sq. ft. single-story house.

Of five bidders on job, this contractor was only one to inspect furnace, which apparently made an excellent impression on the prospect. Considerable "selling" was also required, however.

#### Equipment

1 Holly ARV-38 3-ton air-cooled condensing unit...\$ 452.64

1 McQuay CHV-300 coil .. 120.31

572.95

#### Materials

1 40-ft. length pre-charged line ..... 48.64  
40 ft. pipe insulation ..... 8.80  
30 ft. 1 1/2 in. copper line .. 14.04  
8 ft. 1/2 in. copper line ..... 2.73  
8 ft. 3/4 in. copper line ..... .92  
1 1 1/2 x 90° copper ell ..... .38  
1 1 1/2 in. copper female adapter ..... .64  
1 1 x 1/2 in. copper bushing ..... .37  
1 1 1/2 in. copper coupling .. .25  
1 1/2 in. coupling ..... .13  
1 1/2 in. sight glass ..... 4.88  
2 1/2 in. flare nuts ..... .48  
1 Thermostatic expansion valve ..... 15.55  
1 Thermostat ..... 10.65  
1 Thermostat sub-base ..... 5.21  
1 24-volt relay ..... 6.75  
60 ft. 3-conductor thermostat wire ..... 1.42  
1 concrete base slab ..... 11.50

133.34

26.95

Sublet

Ductwork ..... 53.44

Electrical ..... 70.00

123.44

Warranty ..... 35.00

Total Direct Cost ..... 891.68

Gross Profit ..... 261.32

Selling Price .....\$1,153.00

#### Service Record

One in-warranty service call involving shortage of refrigerant and noisy blower due to bad bearings and shaft. A new blower was installed at no cost to customer. 10 lbs. Refrigerant-22 ....\$ 10.70

Six weeks later there was another service call caused by shortage of refrigerant. At this time it was determined that the pressure relief valve was defective and not seating properly.

12 lbs. Refrigerant-22 ....\$ 12.84

Labor ..... 17.91

### Case No. 4 \$1,198

Job No. 5741: Add 3-ton air-cooled condensing unit and coil to existing heating system in 1,200-sq. ft. one-story house.

This sale was made solely on price.

#### Equipment

1 Westinghouse AU-401 3-ton air-cooled condensing unit .....\$ 398.00

1 Holly 3-ton coil ..... 124.00

1 control package ..... 25.00

547.00

#### Materials

20 ft 3/4 in. copper line ... 6.80  
15 ft. 1/2 in. copper line ... 4.50  
3 1/2 in. copper couplings .. .39  
6 1/2 in. x 90° copper ell .. 1.02

4 1/2 in. x 45° copper ell .. .60  
1 1/2 x 1/2 in. sweat fitting .. .18  
3 1/2 in. flare nuts ..... .75  
1 1/2 in. galvanized union .. .46  
1 1/2 in. sight glass ..... 2.25  
1 drier ..... 5.60  
30 ft. 2-conductor thermostat wire ..... 3.90  
20 ft 4-conductor thermostat wire ..... 4.80  
15 lbs. Refrigerant-22 .... 15.00

46.25

Direct Labor ..... 128.68

Sublet

Ductwork ..... 52.00

Electrical ..... 95.00

147.00

Warranty ..... 35.00

\*Flowers ..... 5.00

Total Direct Cost ..... 908.93

Gross Profit ..... 289.07

Selling Price .....\$1,198.00

#### Service Record

No service calls were reported in the first month of operation.

\*At the completion of every residential air conditioning installation this contractor makes a gift of a "dish garden" to the housewife. Receiving a gift from a contractor is such a novelty that it makes an excellent impression, especially on the housewife, according to the contractor. Not only is the owner much more willing to show the system to other prospects, but he usually omits those "nuisance" service calls.

The \$5 cost of the dish gard is sometimes itemized on the individual job cost records; sometimes merely included in overhead.

### Case No. 5 \$1,200

Job No. 5740: Add 3-ton air-cooled remote condensing unit and 3-ton coil to existing heating system; install new opening in kitchen ceiling; replace return air grilles; re-insulate supply duct in 1,300-sq. ft. single-story ranch type house.

This sale was made solely on price.

#### Equipment

1 Westinghouse AU-401 3-ton air-cooled condensing unit .....\$ 398.00

1 Westinghouse 3-ton coil ..... 75.00

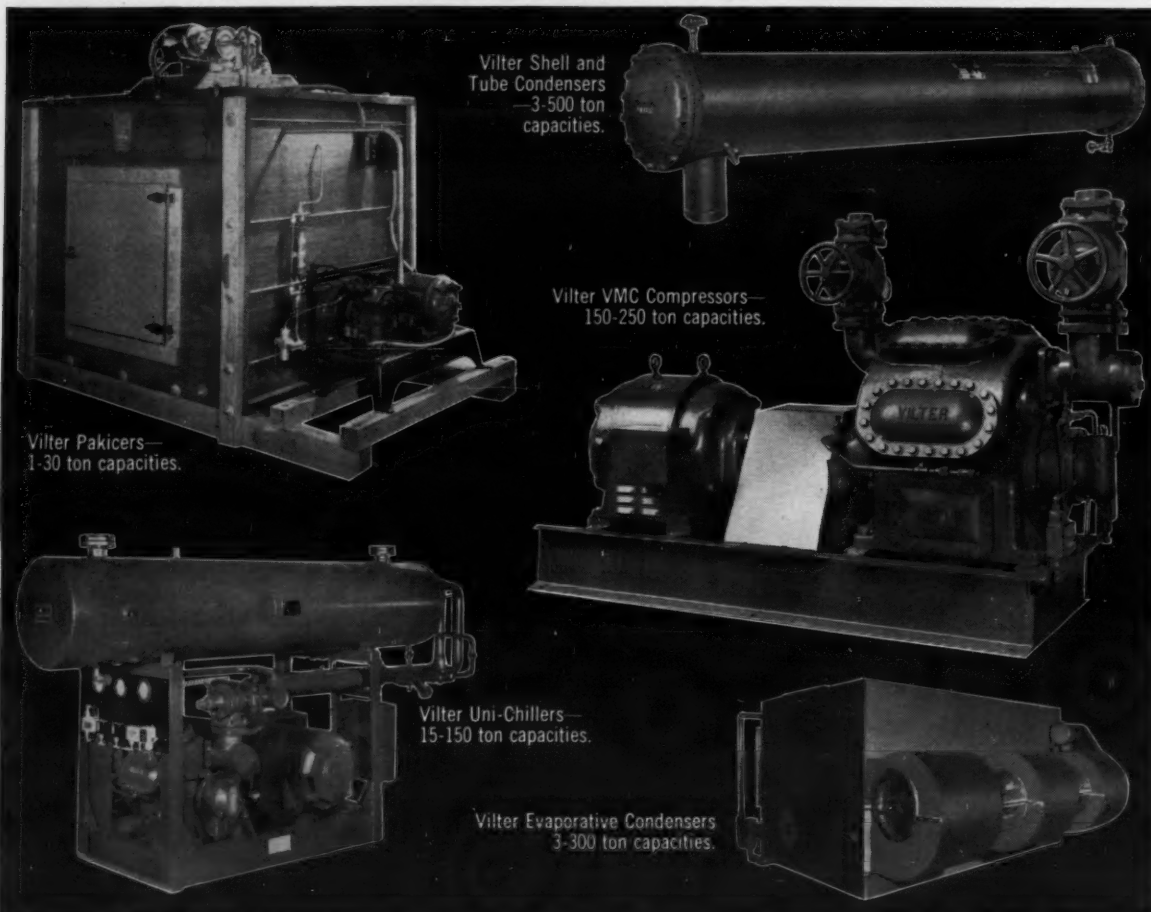
1 control package ..... 25.00

498.00

Materials

35 ft. 1 1/2 in. copper line .. 16.45  
35 ft. 1/2 in. soft copper line .. 11.90  
20 ft. 1/2 in. hard copper line ..... 6.00  
50 ft. 1/2 in. copper line .. 7.00  
70 ft. pipe insulation ..... 15.40  
5 1 1/2 in. copper ell ..... 1.90  
1 1/2 in. copper ell ..... .17  
4 1/2 in. x 90° copper ell .. .68  
1 1/2 in. flare nut ..... .25  
1 ft. rubber hose ..... .15  
2 hose clamps ..... .40

(Continued on next page)



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# Makes \$399 Gross Profit on High Bid--

(Concluded from preceding page)

50 ft. 2-conductor thermo-stat wire .....	6.50
30 ft. 4-conductor thermo-stat wire .....	7.20
15 lbs. Refrigerant-22 ....	15.00
3 14 x 6-in. grilles and 2 30 x 6 in. return air grilles .....	19.63
<b>Direct Labor</b> .....	<b>80.00</b>
<b>Sublet</b> .....	<b>108.63</b>
Ductwork .....	166.00
Electrical .....	90.00
<b>Warranty</b> .....	<b>256.00</b>
<b>Total Direct Cost</b> .....	<b>977.63</b>
<b>Gross Profit</b> .....	<b>222.37</b>
<b>Selling Price</b> .....	<b>\$1,200.00</b>

**Service Record**  
No service calls were reported in first seven weeks of operation.

## Case No. 6 \$1,232

Job No. 5716: Add 3-ton remote air-cooled condensing unit and 3-ton coil to heating system in 1,400-sq. ft. one-story ranch type house. Ductwork to be insulated.

Salesman was well acquainted with prospect's brother. House was surveyed. Job was sold on "stability" of firm and service record. This contractor's price was high.

Equipment	Cost
1 Holly ARV-38 3-ton air-cooled condensing unit ..\$	452.96
1 Holly 3-ton coil .....	144.40
	<b>597.36</b>

Materials	Cost
1 40-ft. length pre-charged line .....	48.64
1 concrete slab base .....	5.75
1 thermostat .....	10.65
1 thermostat sub-base ....	5.21
5 ft. pipe insulation .....	1.10
40 ft. 2-conductor thermo-stat wire .....	5.20
10 ft. 4-conductor thermo-stat wire .....	2.40
1 control panel .....	9.00

<b>Direct Labor</b> .....	<b>87.95</b>
<b>Sublet</b> .....	<b>18.71</b>
Ductwork .....	83.98
Electrical .....	70.00
	<b>153.98</b>

<b>Warranty</b> .....	<b>35.00</b>
<b>Total Direct Cost</b> .....	<b>893.00</b>
<b>Gross Profit</b> .....	<b>339.00</b>
<b>Selling Price</b> .....	<b>\$1,232.00</b>

## Service Record

No service calls were recorded during the 90-day warranty period. Five service calls were made in the several weeks following the warranty period:

1. Unit short cycles.	
3 lbs. Refrigerant-22 .....	3.21
Labor .....	21.94
2. Leak in suction line connection.	
2½ lbs. Refrigerant-22 ....	2.68
Labor .....	8.40
3. No air conditioning. A lengthy check was made of blower, motor; bearings were oiled, etc.	
Labor .....	22.40
4. Leak in suction line.	
Labor .....	8.95
5. No cooling. Replaced safety valve with fusible plug.	
Fusible plug. ....	.59
8 lbs. Refrigerant-22 .....	8.56
Labor .....	14.16

## Case No. 7 \$1,248

Job No. 5732: Add 3-ton remote air-cooled condensing unit and 3-ton coil to existing heating system in 1,475-sq. ft. one-story ranch type house.

This sale was the result of a "selling job."

Equipment	Cost
1 Westinghouse AU-401 3-ton remote air-cooled condensing unit .....	\$ 398.00
1 Westinghouse 3-ton coil ..	75.00
1 Westinghouse control package .....	25.00
	<b>498.00</b>

Materials	Cost
75 ft. ¾ in. copper line ...	18.00
65 ft. ¾ in. copper line ...	11.05
6 ft. ¾ in. copper line ....	.90
80 ft. pipe insulation .....	17.60
5 ¾ in. copper ells .....	.85
75 ft. 2-conductor thermo-stat wire .....	9.75
15 ft. 4-conductor thermo-stat wire .....	3.60
10 ft. 3-conductor Romex ..	1.50
12 lbs. Refrigerant-22 ....	7.80

3 in. ¾ in. hose .....	.10
2 ¾ in. hose clamps .....	.30
1 24 x 18 in. grille .....	4.42
1 14 x 8 in. grille .....	5.19
	<b>81.06</b>

<b>Direct Labor</b> .....	<b>74.54</b>
<b>Sublet</b> .....	<b>113.00</b>
Ductwork .....	90.00
Electrical .....	203.00
	<b>35.00</b>

<b>Warranty</b> .....	<b>35.00</b>
<b>Total Direct Cost</b> .....	<b>891.60</b>
<b>Gross Profit</b> .....	<b>356.40</b>
<b>Selling Price</b> .....	<b>\$1,248.00</b>

## Service Record

Three in-warranty service calls have been reported on this job:

1. Fan motor wouldn't run. Serviceman freed fan shaft.	
Labor .....	\$ 8.95
2. Condenser fan motor wouldn't run. Replaced from unit in stock.	
Labor .....	\$ 20.77
3. Leak in system.	
2 lbs. Refrigerant-22 .....	\$ 2.14
Labor .....	14.16

## Case No. 8 \$1,273

Job No. 5738: Install 3-ton air-cooled condensing unit, 3-ton coil, 120,000 B.t.u. gas furnace in 1,550-sq. ft. single story house on a time-and-material basis. Owner (a roofing contractor) installed own ductwork to contractor's design.

Basis of sale was primarily the brand of cooling system offered.

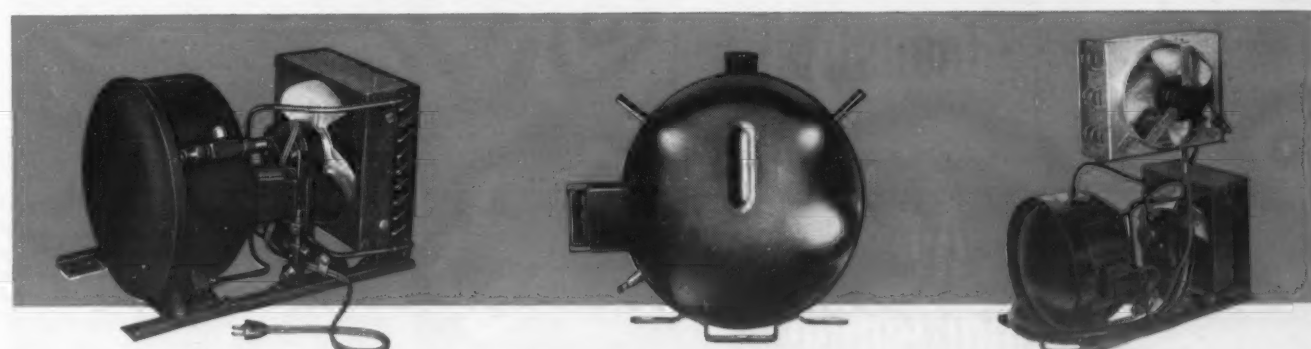
Equipment	Cost
1 Frigidaire CARW-300-23 3-ton condensing unit ..\$	629.86
1 Frigidaire CVW coil ....	111.30
1 Holly 120,000 B.t.u. gas furnace .....	175.56
	<b>916.72</b>

Materials	Cost
12 ft. 1½ in. copper line ..	5.62
12 ft. ½ in. copper line ...	2.81
6 1½ in. copper ells .....	2.28
8 ft. pipe insulation .....	1.70
8 ft. ¾ in. galvanized pipe	1.30
6 ft. ½ in. galvanized pipe	.75
4 ¾ in. galvanized ells ...	.64
3 ¾ in. galvanized ells ...	.36
1 ¾ x ½ in. ell .....	.27
1 ¾ in. union .....	.42

(Continued on next page)

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High Temp Range	LOW
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## Job 9: Uses 60 Ft. of Copper Line, 28 Ft. of Galvanized Pipe--

(Continued from preceding page)

1 1/2 in. gas cock .....	.90
30 lbs. Refrigerant-12 .....	15.00
1 qt. 300 vis. oil .....	.55
1 pre-cast concrete slab ..	11.50
1 coil transition .....	7.50

<b>Direct Labor</b> .....	<b>51.60</b>
<b>Warranty</b> .....	<b>57.33</b>
<b>Flowers</b> .....	<b>35.00</b>
<b>Flowers</b> .....	<b>5.00</b>

<b>Total Direct Cost</b> .....	<b>1,065.65</b>
<b>Gross Profit</b> .....	<b>207.72</b>

<b>Selling Price</b> .....	<b>\$1,273.37</b>
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**Service Record**  
No service calls had been reported in first two months of operation.

### Case No. 9 \$1,283

**Job No. 5731:** Add 3-ton air-cooled condensing unit and 3-ton coil to existing ductwork, add ceiling outlet in living room of 1,350-

sq. ft. single-story house. This installation was sold on a single call. Strictly a "selling job," according to the salesman.

Equipment	Cost
1 Westinghouse AU-401 3-ton condensing unit .....	\$ 398.00
1 Holly 3-ton coil .....	124.64
1 Westinghouse control package .....	25.00

### Materials

30 ft. 1/2 in. copper line ...	10.20
30 ft. 3/4 in. copper line ...	3.84
30 ft. pipe insulation .....	6.60
5 1/2 in. copper ells .....	.85
28 ft. 1 in. galvanized pipe ..	6.44
4 1 in. galvanized ells .....	.21
1 1/2 x 45° galvanized ell ..	.23
1 1/2 in. union .....	.61
1 thermostat .....	18.15
30 ft. 2-conductor thermostat wire .....	3.90
10 ft. 4-conductor thermostat wire .....	2.40
10 lbs. Refrigerant-22 .....	6.50

1 grille .....	5.11
<b>Sublet</b> .....	<b>65.04</b>

<b>Direct Labor</b> .....	<b>84.20</b>
<b>Ductwork</b> .....	<b>89.00</b>
<b>Electrical</b> .....	<b>95.00</b>

Bid of \$1,475 was high on job, but the prospect, an engineer, said he liked the idea of vertical air discharge from the condensing unit and was favorably impressed by the salesman's referring "to the book" to answer technical questions.

<b>Warranty</b> .....	<b>35.00</b>
<b>Total Direct Cost</b> .....	<b>915.88</b>
<b>Gross Profit</b> .....	<b>367.12</b>

**Selling Price** .....

### Service Record

One service call was reported in first two months of operation. This involved tightening of a loose control wire and the installation of a baffle to improve air distribution through the V-type coil which had been offset slightly above plenum to fit space. Two new air filters were also installed.

2 air filters .....	\$ 2.20
<b>Labor</b> .....	<b>23.60</b>

### Case No. 10 \$1,475

**Job No. 5736:** Add 5-hp. 3-phase air-cooled condensing unit and coil to existing heating system in 1,845-sq. ft. single-story ranch style house.

Bid of \$1,475 was high on job, but the prospect, an engineer, said he liked the idea of vertical air discharge from the condensing unit and was favorably impressed by the salesman's referring "to the book" to answer technical questions.

### Equipment

1 Westinghouse AU-601 5-hp. condensing unit .....	\$ 526.65
1 Westinghouse DXV-62 coil .....	120.00
1 Westinghouse control package .....	25.00

### Materials

40 ft. 1 1/2 in. copper line ..	25.20
45 ft. 1/2 in. copper line ...	10.80
15 ft. 1 1/2 in. copper line ..	7.05
4 1 1/2 in. copper ells .....	1.84
4 1 1/2 in. copper ells .....	1.52
1 1/2 in. copper ell .....	.17
1 1 1/2 in. pipe x 1/4 flare ..	.15
45 ft. pipe insulation .....	12.60
15 ft. pipe insulation .....	3.30
1 ft. 1/2 in. hose .....	.25
2 1/2 in. hose clamps .....	.30
8 lbs. concrete mix .....	9.48
25 lbs. Refrigerant-12 .....	12.50

<b>Direct Labor</b> .....	<b>85.16</b>
<b>Sublet</b> .....	<b>104.52</b>

<b>Ductwork</b> .....	<b>77.22</b>
<b>Electrical</b> .....	<b>119.00</b>

**Warranty** .....

<b>Total Direct Cost</b> .....	<b>1,092.55</b>
<b>Gross Profit</b> .....	<b>382.45</b>

**Selling Price** .....

### Service Record

Four service calls were reported in the first six weeks of operation:

1. Complaint of "no cooling."	
2 lbs. Refrigerant-12 .....	\$ .98
<b>Labor</b> .....	<b>21.70</b>
2. Complaint of "no cooling."	
Thermostat reset was out, and a fuse was blown.	
<b>Labor</b> .....	<b>\$ 8.95</b>
3. Unit short cycling.	
<b>Labor</b> .....	<b>\$ 4.72</b>
4. New high-low pressure switch installed.	
<b>Labor</b> .....	<b>\$ 7.08</b>

### Case No. 11 \$1,659

**Job No. 5742:** Add 3-ton air-cooled condensing unit, 3-ton coil, new blower motor to existing heating system; add supply ducts to kitchen and bathroom; change ceiling grilles in living room of 1,550-sq. ft. ranch style house.

Contractor was high bidder on this job, but sale was made by "selling" prospect.

### Equipment

1 Frigidaire CARW-300-21 air-cooled condensing unit .....	\$ 649.84
1 McQuay coil .....	82.26
1 1/2-hp. blower motor .....	20.54
1 control panel .....	9.00

### Materials

80 ft. 1 1/2 in. copper line ..	37.60
80 ft. 3/4 in. copper line ...	19.20
9 1 1/2 in. copper ells .....	3.42
50 ft. 1 1/2 in. Armaflex ....	21.50
20 ft. pipe insulation .....	4.40
25 ft. 1 1/2 in. galvanized pipe .....	7.75
5 ft. 1 1/2 in. galvanized pipe ..	1.55
4 1 1/2 in. galvanized ells ..	1.92
3 1 1/2 in. galvanized ells ..	1.44
1 1 1/2 in. galvanized reducing ell .....	.55
2 1/2 x 4 in. galvanized nipples .....	.20
1 1/2 in. galvanized union ..	.46
1 1 1/2 x 5 in. galvanized nipple .....	.22
1 thermostatic expansion valve .....	15.00

35 lbs. Refrigerant-12 .....	17.50
2 relays .....	13.50
3 8 in. diffusers .....	3.60
1 6 in. diffuser .....	1.00
1 grille .....	4.50

<b>Direct Labor</b> .....	<b>155.31</b>
<b>Sublet</b> .....	<b>158.86</b>

<b>Ductwork</b> .....	<b>254.86</b>
<b>Electrical</b> .....	<b>95.00</b>

**Warranty** .....

<b>Flowers</b> .....	<b>349.86</b>
<b>Flowers</b> .....	<b>35.00</b>

<b>Total Direct Cost</b> .....	<b>1,465.67</b>
<b>Gross Profit</b> .....	<b>193.33</b>

<b>Selling Price</b> .....	<b>\$1,659.00</b>
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**Service Record**  
No service calls were reported in the first seven weeks of operation.

### Case No. 12 \$1,725

**Job No. 5739:** Install new furnace on existing crawl space system and add 3-ton remote air-cooled condensing unit and coil; raise and insulate supply ducts; add two supply openings to enclosed porch; revamp return air duct; provide acoustical insulation in return air duct in 1,450-sq. ft. one-story ranch type house.

Buyer was personal acquaintance of head of contracting firm.

### Equipment

1 Holly gas furnace .....	\$ 173.28
1 Holly 3-ton remote condensing unit .....	452.96
1 Holly coil .....	127.75

**Warranty** .....

<b>Total Direct Cost</b> .....	<b>1,092.55</b>
<b>Gross Profit</b> .....	<b>382.45</b>

**Selling Price** .....

### Service Record

Four service calls were reported in the first six weeks of operation:	
1. Complaint of "no cooling."	
2 lbs. Refrigerant-12 .....	\$ .98
<b>Labor</b> .....	<b>21.70</b>
2. Complaint of "no cooling."	
Thermostat reset was out, and a fuse was blown.	
<b>Labor</b> .....	<b>\$ 8.95</b>
3. Unit short cycling.	
<b>Labor</b> .....	<b>\$ 4.72</b>
4. New high-low pressure switch installed.	
<b>Labor</b> .....	<b>\$ 7.08</b>

### Case No. 13 \$1,760

**Job No. 5728:** Install year-round system (3-ton air conditioner and 100,000 B.t.u. gas furnace) and ductwork in 1,450-sq. ft. single-story home which is an estimated 25 years old or more.

This sale was made as the result of a "selling job" by the salesman.

### Equipment

1 Holly gas furnace .....	\$ 152.00
1 Westinghouse AU-401 air-cooled condensing unit .....	398.00
1 Westinghouse coil .....	75.00
1 Westinghouse control package .....	25.00

### Materials

80 ft. 1 1/2 in. copper line ..	37.60
80 ft. 3/4 in. copper line ...	19.20
9 1 1/2 in. copper ells .....	3.42
50 ft. 1 1/2 in. Armaflex ....	21.50
20 ft. pipe insulation .....	4.40
25 ft. 1 1/2 in. galvanized pipe .....	7.75
5 ft. 1 1/2 in. galvanized pipe ..	1.55
4 1 1/2 in. galvanized ells ..	1.92
3 1 1/2 in. galvanized ells ..	1.44
1 1 1/2 in. galvanized reducing ell .....	.55
2 1/2 x 4 in. galvanized nipples .....	.20
1 1/2 in. galvanized union ..	.46
1 1 1/2 x 5 in. galvanized nipple .....	.22
1 thermostatic expansion valve .....	15.00

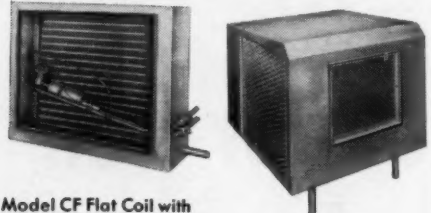
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# Capitolaire



Model COM Commercial Air Conditioner 3 & 5 ton—Water & Air Cooled



Model CF Flat Coil with Remote Air-Cooled Condensing Unit

## The complete line of



Model VER Fan-Coil Units 200,300,400, & 600 CFM



Model VRS Fan-Coil Unit Summer Cooling—Winter Heating

## • Residential • Commercial • Industrial

## Air Conditioning Products



Model RES Residential Air Conditioner Air Cooled—3 & 5 ton



Model RES Residential Air Conditioner 3 & 5 ton Water Cooled



Model CWG Water Chiller 7 1/2 thru 75 tons



Model AECR Air Conditioner with Built-in Evaporative Condenser 7 1/2 thru 60 tons. Also available as water cooled.



Flexazone Horizontal Model Air Conditioner for multi-room applications. CFM capacities from 1800 to 24,000. Vertical model available.



# Gross Profit Cut \$61.75 by 3 Service Calls--

(Continued from preceding page)

## Materials

60 ft. 3/4 in. copper line ..	20.40
60 ft. 1/2 in. copper line ..	10.20
5 3/4 x 90° copper ells .....	.85
1 1/2 in. copper coupling ..	.13
1 1/2 in. copper female adapter .....	.21
25 ft. 3/4 in. galvanized pipe	4.05
6 1/2 x 6 in. galvanized nipples .....	.66
1 1/2 in. union .....	.42
2 1/2 x 90° galvanized ells ..	.24
1 3/4 x 1/2 galvanized reducer .....	.21
1 1/2 in. gas cock .....	1.00
1 3/4 in. gas cock .....	1.00
2 3/4 x 5 in. nipples .....	.24
1 3/4 in. tee .....	.24
1 3/4 in. union .....	.46
2 3/4 x short nipples .....	.14
7 lbs. Refrigerant-22 .....	3.50
1 sheet 3 ft. x 4 ft. x 5/8 in. plywood .....	4.00
20 ft. 2 x 4 in. fir .....	3.00
2 30 x 8 in. return air grilles .....	4.42
1 12 in. diffuser .....	11.60
2 14 x 6 in. diffusers .....	9.00
2 12 x 6 in. diffusers .....	8.22
9 ft. 5 in. flue pipe .....	8.01
1 flue top .....	1.99
1 flue storm collar .....	.56
1 flue flashing .....	1.64
2 5 in. x 45° flue elbows .....	3.86

100.25  
Direct Labor ..... 215.13

Sublet  
Ductwork ..... 394.08  
Electrical ..... 95.00

489.08  
Warranty ..... 35.00

Total Direct Cost ..... 1,489.46  
Gross Profit ..... 270.54

Selling Price ..... \$1,760.00

## Service Record

Three service calls were reported in first four months:

1. Complaint of poor cooling led to a change of filters.

Filters .....\$ 1.12  
Labor ..... 7.08

2. Another complaint of poor cooling.

3 lbs. Refrigerant-22 .....\$ 3.21  
Labor ..... 6.71

3. No cooling complaint. Defective compressor, capacitor, and resistor were replaced and system re-charged.

12 lbs. Refrigerant-22 .....\$ 5.88  
Labor ..... 36.75

Case No. 14 \$1,896

Job No. 5723: Install 3-ton air-cooled condensing unit; build 3-ton air-handling unit to fit space in attic; install and insulate duct to seven openings in one-story 1,820-sq. ft. house.

Sale was made on basis of engineering, particularly designing and building air-handling unit to fit available space.

## Equipment

1 Frigidaire CARW-300-21 air-cooled condensing unit .....	\$ 649.84
1 coil .....	105.05
1 blower .....	25.00
1 1/2-hp. blower motor .....	22.00

## Materials

80 ft. 1 1/2 in. copper line ..	37.60
50 ft. 3/4 in. copper line ..	12.17
15 ft. 1/2 in. copper line ..	2.76
50 ft. pipe insulation .....	15.00
1 drier .....	5.60
1 1/2 in. sight glass .....	1.80
4 1/2 in. flare nuts .....	.60
1 1 1/2 in. x 45° copper ell ..	.49
11 1 1/2 in. x 90° copper ells ..	4.18
1 3/4 in. coupling .....	.13
1 3/4 in. male adapter .....	.16
22 lbs. Refrigerant-12 .....	14.30
1 thermostat .....	10.65
1 relay .....	5.60
1 sequence control .....	9.00
50 ft. 3-conductor thermostat wire .....	6.50

15 ft. 4-conductor thermostat wire .....	3.60
1 V-belt .....	.91
6 grilles .....	46.24
1 12 x 6 in. grille .....	3.12
1 return air grille .....	5.15
1 pre-cast concrete slab ..	11.50

197.06  
Direct Labor ..... 144.74

## Sublet

Ductwork (including fabrication of air-handling unit) ..... 480.59 || Electrical ..... | 120.00 |

600.59  
Warranty ..... 35.00

Total Direct Cost ..... 1,779.28

Gross Profit ..... 116.72

Selling Price ..... \$1,896.00

## Service Record

One complaint of "no air conditioning" was received in first two months of operation. Inspection re-

vealed that the relay had fused and the compressor had locked. A factory replacement for the burned out compressor was not immediately available, so a compressor was removed from a unit in stock and installed on job.

20 lbs. Refrigerant-12 .....\$ 10.00  
Labor ..... 61.33

Case No. 15 \$1,896

Job No. 5745: Install 3-ton air-cooled condensing unit, 3-ton coil, and ductwork in 1,800-sq. ft. one-story house estimated to be 30 years old. Owner, a general contractor, to handle own cutting, patching, piping, and provide concrete slab for condensing unit.

This was strictly a "selling job," according to the salesman.

## Equipment

1 Frigidaire CARW-300-21 condensing unit .....	\$ 649.84
1 Frigidaire CBW-300 air-handling unit .....	209.87

Freight on air-handling unit ..... 6.84

## Materials

40 ft. 1 1/2 in. copper line ..	18.80
40 ft. 3/4 in. copper line ..	9.60
25 ft. 1 1/2 in. Armaflex .....	10.75
9 1 1/2 x 90° copper ells .....	3.42
2 1/2 in. flare nuts .....	.50
20 ft. pipe insulation .....	5.40
1 drier .....	5.60
25 lbs. Refrigerant-12 .....	12.50
30 ft. 1 in. galvanized pipe	6.90
1 1 in. galvanized coupling	.19
4 1 x 90° galvanized ells ..	.84
1 3/4 x 2 in. galvanized nipple .....	.07
1 1 x 3/4 in. galvanized reducing tee .....	.51
1 thermostat and base .....	15.11
1 transformer .....	6.23
2 relays .....	13.50
50 ft. 2-conductor thermostat wire .....	6.50
15 ft. 4-conductor thermostat wire .....	3.60
Grilles .....	57.68
Registers .....	17.67

195.37

Direct Labor ..... 64.07

## Sublet

Ductwork ..... 456.13  
Electrical ..... 90.00

546.13  
Permit ..... 1.75

Flowers ..... 5.00

Warranty ..... 35.00

Total Direct Cost ..... 1,713.87

Gross Profit ..... 182.13

Selling Price ..... \$1,896.00

## Service Record

No service calls were reported in the first six weeks of operation.

Case No. 16 \$1,959

Job No. 5711: Install complete year-round system including 3-ton remote air-cooled condensing unit, 3-ton coil, 120,000 B.t.u. gas furnace, ductwork, etc., in 1,800-sq. ft. one-story house nearly 40 years old.

Salesman offered prospect choice (Concluded on next page)

Keeps the whole house clean electronically!



NEW **Electro-Klean**®

Electronic Home Air Filter

## NEW LOW PRICE

### One-half the Cost of Competitive Units!

Every homeowner in your locality has a dirt and dust problem. They're all grade A prospects for you when you sell *Electro-Klean*!

*Electro-Klean* Electronic Home Air Filter solves the household dust problem at the source... catches

### Simple Installation!

No Water or Sewer Connection  
No Special Wiring Circuit

You can do a big volume electronic air filter business without extra help. *Electro-Klean* is quickly installed in the air return of any forced air furnace or air conditioning system.

No after-service problems. Fully guaranteed. No plates to wash. No wires to break. No moving parts to get out of order.

airborne dust and pollen like a magnet attracts and holds bits of iron. *Electro-Klean* actually "house-cleans" every room in the house all day long, every day in the year... actually traps up to 20 times more dirt than throw-away filters! Yet the cost is small... just one-half the price of comparable units. Any home can now afford electronic air filtration!

### Mail Coupon for details, NOW!



a product of the world's largest manufacturer of air filters  
**AMERICAN AIR FILTER COMPANY, INC.**  
109 Central Avenue, Louisville 8, Ky.

Send me details of the new promotion plan for *Electro-Klean*, descriptions, pictures and prices.

NAME .....

FIRM .....

ADDRESS .....

CITY ..... ZONE ..... STATE .....



# Gets 5 'No Air Conditioning' Complaints on 1 Job--

(Concluded from preceding page)

of three different makes. "Strictly selling" involved here, according to salesman.

Equipment	Cost
1 Holly 3-ton air-cooled condensing unit	\$452.96
1 Holly coil	124.40
1 Holly furnace	175.56

Materials	
40 ft. pre-charged line	48.64
1 8 in. diffuser	1.20
2 6 in. diffusers	2.08
4 10 in. diffusers	5.76
3 grilles	5.90
1 6 in. flue top	2.94
1 6 in. flue storm collar	.60
1 6 in. flue flashing	2.38
1 length flue pipe	5.11
1 pre-cast concrete slab	11.50

Direct Labor	85.08
Sublet	49.90
Ductwork	579.35

Electrical	80.00
Permits	3.75
Petty Cash	2.00
Warranty	35.00

Total Direct Cost	1,589.03
Gross Profit	369.97

Selling Price	\$1,959.00
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## Service Record

Five service calls were recorded in first five months system was in operation:

1. "No air conditioning" complaint. Fuse was blown.
2. 30 amp. fuses
3. Adjust grilles.
4. Adjust grilles to supply more air to living room; stop noise in bedroom.

Filters	\$4.90
Labor	6.96
5. "No air conditioning" complaint, resulting from defective (improperly seating) relief valve.	
Fusible plug	.14
9 lbs. Refrigerant-22	9.63
Labor	14.00

## Case No. 17 \$2,298

Job No. 5704: Install complete year-round system (including 5-ton remote condensing unit, coil, 150,000 B.t.u. gas furnace, and ductwork) in 2,300-sq. ft. one-story house, owner to furnish wiring.

Job was sold chiefly by step-son of prospect, who had purchased a system from contractor the year before. Prospect was sold on quality job and good service.

Equipment	Cost
1 Frigidaire CARW-500-23 remote air-cooled condensing unit	\$850.63
1 McQuay coil	82.26
1 Lennox gas furnace	282.50

Materials	
30 ft. 1 1/2 in. copper pipe	23.37
30 ft. 1/2 in. copper pipe	8.39
48 ft. 1 1/2 in. copper pipe	32.16
48 ft. 1/2 in. copper pipe	12.00
2 1 1/2 x 90° copper ells	1.25
5 1 1/2 in. copper ells	3.12
1 1 1/2 in. copper ell	.40
15 ft. Armoflex	5.10
15 ft. pipe insulation	6.75
1 thermostatic expansion valve	17.80
30 ft. 1 1/2 in. Armoflex	13.80
30 ft. pipe insulation	13.48
40 ft. 1 1/2 in. galvanized pipe	12.40
21 ft. 1 1/2 in. galvanized pipe	5.90
8 ft. 1 1/2 in. galvanized pipe	11.76
3 1 1/2 x 90° galvanized ells	1.44
6 1 1/2 x 90° galvanized ells	2.88
1 1 1/2 x 45° galvanized ell	.58
1 2 in. galvanized reducer	.73
6 3/4 x 45° ells	.96
1 1/2 in. galvanized union	.46
1 1/2 in. galvanized union	.42
Pipe fittings	4.54
1 relay and transformer	10.00
1 3-pole switch	2.99
35 lbs. Refrigerant-12	13.25

1 qt. 300 vis. oil	1.50
Grilles and outlets	21.52
Filters and oil	7.94
3 ft. 7 in. flue pipe	4.35
2 7 in. flue elbows	7.08
1 pre-cast concrete slab	18.75

Direct Labor	262.43
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Sublet	157.52
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Ductwork	518.87
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Permit	2.00
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Warranty	30.00
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Total direct Cost	2,186.21
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Gross Profit	111.79
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Selling Price	\$2,298.00
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## Service Record

One service call was reported in first six months of system's operation. It was determined that the high pressure control was set too low.

8 lbs. Refrigerant-12	\$3.92
Labor	18.60

## Case No. 18 \$2,330

Job No. 5733: Install complete cooling system (including 3-ton 3-phase remote air-cooled condensing unit, air-handling unit, and ductwork), and insulate attic of 1,500-sq. ft. single-story ranch style house.

This contractor's bid was the highest price, but the prospect was convinced this firm would give him exactly what he wanted while he doubted that others would.

Equipment	Cost
1 Frigidaire CARW-300-23 condensing unit	\$629.86
1 Frigidaire CBW-300 coil	221.47

Materials	
45 ft. 1 1/2 in. copper line	21.15
45 ft. 1/2 in. copper line	7.65
12 ft. 1 1/2 in. Armoflex	5.16
15 ft. pipe insulation	3.75
7 1 1/2 in. copper ells	2.66
11 ft. 1 1/2 in. galvanized pipe	3.96
1 1 1/2 in. reducing ell	.55
3 1 1/2 x 90° ells	1.56
2 1 1/2 x 45° ells	1.16
1 1/2 in. tee	.19
1 1/2 in. union	.43
1 drier	5.60
20 lbs. Refrigerant-12	10.00
1 thermostat and sub-base	15.86
2 relays	12.00
1 24-volt transformer	3.68
1 400-ft. roll foilback insulation	86.80
10 registers and grilles	49.60

Direct Labor	231.76
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Sublet	126.55
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Ductwork	844.79
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Electrical	190.00
Warranty	35.00

Total Direct Cost	2,279.43
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Gross Profit	50.57
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Selling Price	\$2,330.00
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## Service Record

No service calls were reported during first two months of operation.

## Case No. 19 \$2,552

Job No. 5751. Install complete year-round system (including 5-ton remote air-cooled condensing unit, 5-ton coil, 140,000 B.t.u. gas furnace, ductwork, flue), insulate attic, remove three existing jet heaters in two-story 2,500-sq. ft. house of modern design.

Prospect not only wanted air conditioning but a better heating system. Contractor offered choice of three different makes of equipment, including two better known name brands costing about \$300 more. Prospect said he knew of Holly Stove Co., which has no connection whatsoever with selected make of air conditioner, contractor reveals.

Equipment	Cost
1 Holly AR2-60 air-cooled condensing unit	\$718.96
1 Holly coil	154.85
1 Holly furnace	200.64

Materials	
40 ft. 1 1/2 in. copper line	25.20
40 ft. 1/2 in. copper line	9.60
6 1 1/2 x 90° copper ells	2.76
1 1 1/2 x 1 1/2 in. copper reducer	.54
1 1 1/2 x 1 1/2 in. copper reducer	.54
1 1/2 in. hand valve	3.00
1 1/2 in. hand valve	2.10
10 ft. pipe insulation	2.50
10 ft. pipe insulation	2.50
4 ft. 1 in. galvanized pipe	.92
2 1 in. galvanized unions	1.22
2 1 in. x short nipples	.20
1 1/2 x 2 in. galvanized nipple	.07
1 1 x 1/2 x 90° reducer	.33
3 1 in. x short galvanized nipples	.30
1 1 in. galvanized union	.61
2 1 in. x 90° galvanized ells	.42
1 1 1/2 x 1 in. galvanized bushing	.16
2 1 in. pipe x 1 1/2 sweat fittings	1.28
15 lbs. Refrigerant-22	15.75
2 10 amp. fusetrons	.30
3 14 x 6 in. grilles	9.24
1 16 x 6 in. grille	1.78
1 14 x 5 in. grille	3.93
1 16 x 6 in. grille	3.65
2 8 x 4 in. grilles	4.70
1 14 x 6 in. grille	1.85
3 6 in. diffusers	3.12
2 30 x 8 in. return air registers	4.42

1 14 x 8 in. return air register	1.22
14 ft. 6 in. flue pipe	12.88
1 6 in. flue top	2.51
1 6 in. flue storm collar	.63
1 6 in. flue flashing	2.32
1 roll insulation	26.46
1 sack concrete mix	4.70

Direct Labor	153.71
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Sublet	256.70
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Ductwork	248.56
----------	--------

Electrical	115.00
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Set flue flashing	17.50
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Permit	381.06
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Warranty	1.75
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Total Direct Cost	1,902.67
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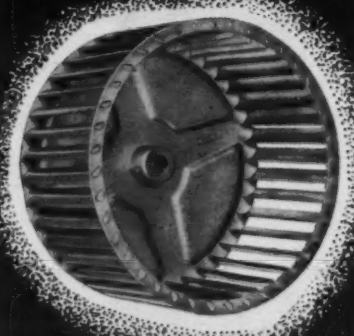
Gross Profit	649.33
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Selling Price	\$2,552.00
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## Service Record

No service calls were reported in first seven weeks of operation.

Westinghouse  
CORPORATION

uses  
**REVCOR  
BLASTAIRE  
BLOWER WHEELS**


because...

Revcor Blower Wheels meet the high performance and quality standards demanded by Westinghouse!

REVCOR SINGLE AND  
DOUBLE INLET  
BLASTAIRE BLOWER  
WHEELS ARE USED BY  
OVER 60% OF THE  
ROOM AIR CONDITIONER  
MANUFACTURERS!

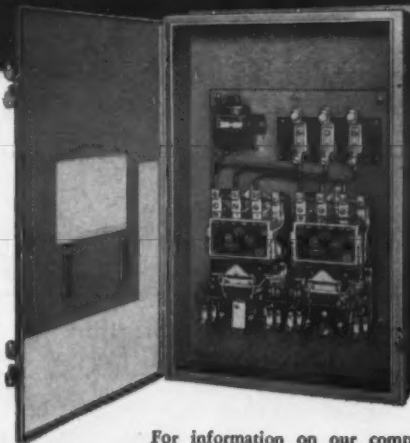
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Specify **FURNAS ELECTRIC  
CONTROLS**

FOR AIR CONDITIONING  
AND REFRIGERATION


Objectionable voltage drops are eliminated by using Furnas Electric Increment Starters for Part Winding motor applications. These starters have won particular acceptance for the larger horsepower air conditioning and refrigeration units.

Increment starting incorporates the advantages of other types of step starting AT THE LOWEST COST IN THE SMALLEST SPACE. Select the size you need: 10, 20\*, 30, 40\*, and 60 hp, 220 volts. There are no expensive auto transformers or resistors.

\*Major savings with these "in-between" sizes.

For information on our complete line of air conditioning and refrigeration controls, write for Bulletin 5519. Furnas Electric Company, 1111 McKee Street, Batavia, Illinois.

A21

**FURNAS ELECTRIC COMPANY**  
BATAVIA, ILLINOIS

SALES REPRESENTATIVES IN ALL PRINCIPAL CITIES



## Preview

# Many Exhibitors Plan To Feature New Products at Chicago Exposition

## Blower To Make Debut Offers Fan-Coil Unit

A new blower will have its first showing in Utility Fan Corp.'s booth 268, highlighting the firm's display, the company announced.

Using 64 large blades, the air conditioning blower is claimed to minimize turbulence and noise due to slow speed. Smaller horsepower is made possible by large bearing surface on the hub which permits smaller shafts, the company said.

## Show Motor Compressors

"Copelaweld" motor-compressors in sizes through 10 hp. will be spotlighted in booths 118-119-120-121-122 by Copeland Refrigeration Corp.

Also shown will be "Copelametic" motor-compressors and condensing units through 10 hp., belt-driven compressors and condensing units through 7½ hp., and automotive compressors.

## Offset Fans Featured

"Back-over-the-motor offset fans," specialty-type aluminum and steel centrifugal blower wheels will be focal point of Brookside Corp.'s booth 428.

Along with that, a wide variety of propeller and centrifugal-type fans of many sizes and descriptions will be shown, the firm said.

## To Display Humidifiers

Walton Laboratories, Inc. will display operating humidifiers of both "In-Duct" and "On-Duct" models in booth 752.

Also offered will be a new industrial humidifier with permanent or cleanable type filter to minimize maintenance, it was noted.

## Exhibit Limit Controls

No. 210 series air conditioning limit controls will be the center of attraction in Penn Controls, Inc.'s booth 541 along with 3246 series three-way water valves and 888 series "Rimset" air conditioning thermostat.

Also shown will be cooling and air conditioning controls, the company added.

## To Highlight Cleaners

Anderson Chemical Co. will highlight in booth 605 its "Anco" line of condenser cleaning, cooling water treatment, algacide, ice machine cleaner, and "No-Mo-Rust" chemicals.

## To Spotlight Blower

Lau Blower Co. will spotlight its "Electro-Wheel" blower, "Pres-lock" wheel, "Lau Pak" bearings, and pulleys in booth 543 along with various blower wheels and pillow blocks.

## Will Delineate Line

To be sharply delineated in booth 703 is a complete line of electric motors for the air conditioning industry, according to A. O. Smith Corp.'s Electric Motor Div.

## To Show Wide Range

New "BFC" belt-driven air-cooled condensers, residential air conditioning coils, low temperature electric defrost "Humi-Temp," and low temperature mullion Humi-Temp units will be highlighted in Larkin Coils, Inc.'s booth 405.

In addition, a redesigned line of half-turret Humi-Temps will be featured.

Other items to be displayed are: unit cooler; "Frost-O-Trol" automatic hot gas defrost unit; remote air conditioners; cooling coils; cooling tower; "FC" air-cooled condensers; and assorted fin coils.

Model CH fan-coil unit for ceiling mounting and an air-cooled condenser with "Sensitizer" for year-round control will be features of booth 359 by Bohn Aluminum & Brass Corp., Betz Div.

Other items to be displayed are: half-round unit coolers; mullion unit coolers; angle-type unit coolers; panel-type unit coolers; and low temperature unit cooler with vapor hermetic automatic defrost system.

## Bow Magnetic Starters

New magnetic starters designed for the heating and air conditioning industry and rated in four sizes will be at the center of Furnas Electric Co.'s booth 654.

In addition, the company says a modern colorful display of electric motor controls featuring advanced designs on economies of interchangeability is planned. Included will be bulk milk cooler control panels, pushbuttons, and other pilot devices.

## Feature New Units

New "Modu-Aire" air conditioning units will be featured in booth 260 by United States Air Conditioning Corp., the firm indicated.

In addition, packaged refrigeration units, air-cooled condensing units and accompanying evaporator assemblies, and refrigerated "Kooler Aire" units will be shown.

## Offer Compact Equipment

New equipment of special interest in booth 546 will be a quieter, more resilient, positive drive hub and five and six-blade propellers designed to meet compact unit requirements, Meier Electric & Machine Co. announced.

Also a complete line of fabricated propellers adaptable to all makers of air-moving equipment, varied partial assemblies of units to show construction methods, and a large variety of steel and neoprene hubs will be exhibited.

## Headline Window Kits

Special window accessory kits, a 2-hp. "Duct-AIRE" air conditioner, and the 1958 line of dehumidifiers and "hot and cold" drinking water coolers will be headlined by Westinghouse Electric Corp. (Springfield, Mass.) in booth 355-356.

Other items to be exhibited are a complete room air conditioner line and standard water cooler line.

## Feature Ball Bearings

Ball bearings and ball bearing power transmission units for air conditioning and air-handling equipment will be featured in booth 261 by Fafnir Bearing Co.

## American Motors Plans Cooling for 8% of Cars

DETROIT—American Motors Corp. plans to install "All-Season" air conditioning in approximately 8% of its 1958 Rambler and Ambassador models, the company announced.

The All-Season auto air conditioning unit for the coming year has been redesigned to offer even better performance, servicing, and convenience, it was explained.

The improved air conditioner, which combines cooling and heating, is optional at low cost, the company pointed out. Outlets for the unit utilize the same instrument panel grilles as the auto's radio.

# Hong Kong Distributor Finds Cooling A Must In Commercial Establishment

LA CROSSE, Wis.—"Air conditioning is an accepted standard of living in Hong Kong, while cooling for industry is steadily assuming greater importance," says T. F. Waung, president, Engineering Service Co., new distributor of Trane equipment in the area.

Waung, here for a series of conferences with Trane sales personnel, was surprised, he said, "to note the absence of air conditioning in many U. S. business places similar to those in Hong Kong, which are all equipped with cooling systems."

"For instance, cooling is as much a customer must in Hong Kong barber shops, theaters, clothing stores, and other business establishments, as is light-

ing. All new hospitals are completely air conditioned, as are most new multi-story office buildings and hotels."

Waung also noted cooling gains on the Free-China industrial scene.

He said that "The cooling trend is especially noticeable in the textile and plastics fields, with growing sales anticipated in the soy bean industry."

"A strong factor in the heavy demand for cooling products," Waung added, "is the Hong Kong climate, where humidity is high and temperature ranges from 90 to 95° eight months of the year."

The new Trane distributor is a veteran of many years in the air conditioning and refrigera-

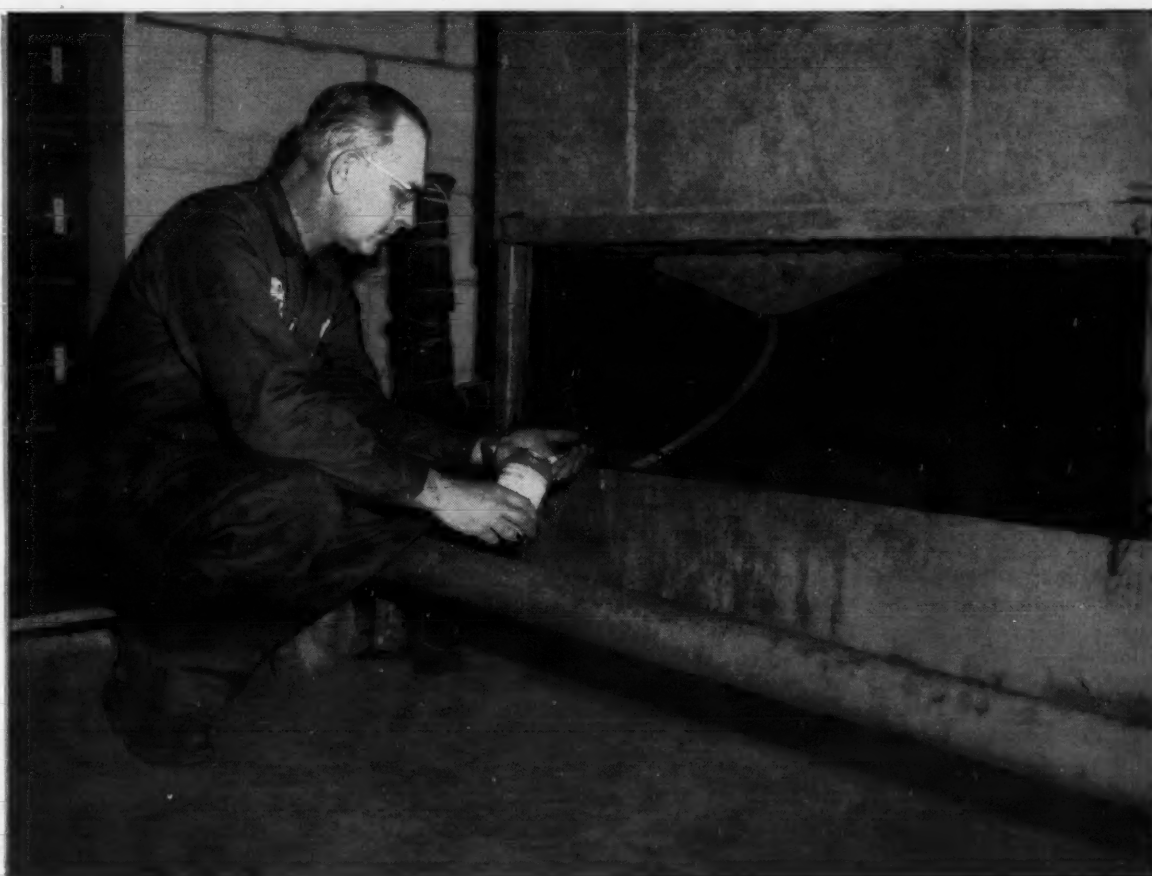
tion industry. He was responsible for changing an early Chinese translation of air conditioning from merely "cold air," to the all-inclusive term of "air conditioning," it was pointed out.

He is a graduate of the University of Southern California and holds degrees in mechanical and electrical engineering. Waung lists membership in the American Society of Heating & Air-Conditioning Engineers and other professional and social organizations.

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# "MAINTENANCE COSTS LOWERED since using Calgon's BIG 3 Cooling Water Treatment Products"

R. C. Hansen, Engineering Department, ACF-Wrigley Stores, Inc.

Maintenance costs on cooling towers and evaporative condensers have gone down since the use of the Calgon BIG 3 products was begun at this Wrigley Supermarket in Livonia, Michigan. Mr. Hansen states that he has used Calgon® Scale Remover, Micromet® Plates and Calgon Algacide and found all three very satisfactory.

Keeping refrigeration and air conditioning systems functioning at top efficiency with minimum maintenance costs, is a job which Calgon's BIG 3 do extremely well. Each is a product of Calgon research and each is designed to perform efficiently and at low cost.

Micromet Plates provide continuous treatment to inhibit further scale formation. A single charge will last about six months and the inexpensive feeding bag is easily installed.

Calgon Algacide controls algae and slime growths. It comes in pellet form for convenience in handling. Positive action kills the growth. Periodic addition keeps equipment operating efficiently.

Calgon Scale Remover makes it easy to clean up a system completely. Corrosion inhibitors protect system while in use. Special built-in pH color indicator shows how much of scale remover to use, and helps tell when system is clean.



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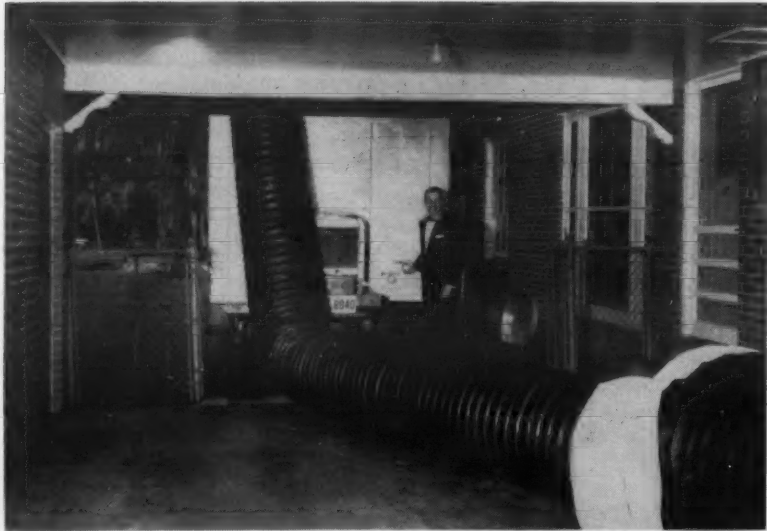


**CALGON COMPANY**

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## Caterer Offers 'Outdoor Air Conditioned' Parties with 60-Ton Portable Ice, Chilled Water Unit To Cool Yard



LEFT: Through this duct air cooled to 35° F. is conducted from a portable 50-ton cooling unit mounted on a trailer hitch at rear to an outdoor party in the back yard of a Houston, Texas home.

BELOW: Shrubbery makes a natural wall on one side of the yard to keep cool air in. Canvas wall at right rear connects shrubbery with the house and completes the enclosure. Food remains tasteful in the 95° afternoon sun which is cut off by an 8-ft. high wall of cool air.

HOUSTON, Texas — A catering firm is offering not only the food and service for an outdoor party but a complete "air conditioning of the premises as well.

The Alabama Catering Service inaugurated the cooling service July 15 with a 60-ton portable ice and chilled water unit capable of air conditioning ships or even outside areas. Its first assignment was to air condition the patio and outside lawn of the home of Dr. and Mrs. Abe Hauser for a party honoring a famous guest, Dr. Leo H. Bartmeir.

### 'NEW IN CATERING'

"This is something new and unique in the catering business," stated Fred Baum, owner of Alabama Catering Service. "We will be able to cater any party in Houston and surrounding area without worrying if the premises are air conditioned or not."

The portable unit has a capacity of about 600,000 B.t.u. per hour, according to its manufacturer. It operates on a gasoline engine at an average cost of 26 cents per ton-hour.

A spokesman for the company explained the unit doesn't try to completely cool an area as



the trade knows "standard air conditioning."

### 'BLANKET AREA TO 8-FT. DEPTH'

"We try to puddle it," explained Stephen Bolling, sales manager. "We dump in cold air to blanket the area to a depth of about 8 ft."

The unit is a chilled water system which uses ice as a refrigerant. Water is sprayed over the ice to get the water down to 35° F. Bolling said the ice and

chilled water arrangement produces better dehumidification and cooling than mechanical refrigeration for the same coil area.

The unit recirculates the air when it is used inside a building. But it is, of course, impossible or impractical outdoors.

Endurance of the ice depends upon the solar load, Bolling pointed out. Under the worst conditions—a broiling sun, high temperature, outdoors—he estimated it will last for about two hours. Under the best conditions—indoors, some help from insulation, not overly hot—the ice lasts seven to eight hours.

### MAY BE RE-ICED

The unit may be easily re-iced while in operation, and the large 40 to 60-ton units hold 9,300 lbs. of ice in 300-lb. blocks, the size favored by ice companies.

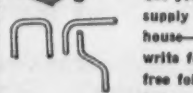
When Alabama Catering Service took the portable unit on its trailer hitch to the lawn party,

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Baum explained, they used the house for one wall to hold in the cool air.

Shrubbery which stood 8 ft. high provided a wall on the opposite side from the house. Baum had a roll of canvas, 30 ft. long by 8 ft. high, placed at the far end of the shrubbery to enclose the area from the end of the shrubbery to the end of the house.

The portable unit made up the other side of the yard, blocking off enough to keep the cool air in.

### 300 ENJOY MEAL

Some 300 people enjoyed a pleasant meal in the afternoon sun without removing their coats or feeling uncomfortable, Baum reported. Just above the 8-ft.-height line the temperature was 95° F., but below it the temperature was in the comfortable range.

"It's expensive to operate," Baum commented, "but with this unit we can cater receptions, parties, events at churches and schools where there is no air conditioning. In this climate (Houston is subtropical with afternoon temperatures in the nineties until early October) that is important and invaluable.

"The air conditioning also keeps the food better."

Maker of the unit is South House, Inc. of New Orleans. The Ready-Kool division produced it. Sales Manager Bolling says the company makes models in sizes from 20-ton to 60-ton capacity with either gasoline power or electric (220-volt) power. The 20-ton operates on 110 volts.

### Air Moving Group Elects 9

DETROIT—Nine new directors were unanimously elected by members of the Air Moving & Conditioning Association (AMCA) at its third annual meeting held recently at the Greenbrier, White Sulphur Springs, W. Va.

Each of the six divisions of the association is represented by one director, in addition to the three directors-at-large. Elected for a one-year period:

L. Macrow, manager of Systems & Equipment Dept. of Machinery & Systems Div., Carrier Corp., representing AMCA's Central Station Air Conditioning Div.

R. A. Wasson, vice president and general manager of Clarage Fan Co., representing the association's Centrifugal Fan Div.

E. J. Stone, sales manager, Propellair Div., Robbins & Meyers, Inc., representing AMCA's Industrial Axial & Propeller Fan Div.

W. A. Curtis, manager of the Blower Div., Peerless Electric Co., representing the Power Roof Ventilator Div.

Wallace Allen, Jr., secretary of American Coolair Corp., representing Unit Heater Div.

J. J. Merrick, division sales manager, John J. Nesbitt, Inc., representing the Unit Heater Div.

Also elected directors-at-large for a one-year term are: W. H. Rietz, president Ilg Electric Ventilating Co.; J. W. Wilcock, sales manager of the Sturtevant Div., Westinghouse Electric Corp.; and C. W. Lockhart, sales manager of the Blower & Air Div., Buffalo Forge Co.

## First Burmese Bldg. Air Conditioned To Lure Bank Clients

SYRACUSE, N. Y.—Burmese bankers are now wooing the public with what is reported to be the nation's first complete air conditioning system in a financial institution.

Carrier Corp. has disclosed that it has air conditioned the recently-expanded Hong Kong and Shanghai Banking Corp. branch in Rangoon, through the East Asiatic Co., Ltd., its distributor in Burma, which has installed a 36-ton system in the branch.

Other branches of the Hong Kong and Shanghai Banking Corp. air conditioned with Carrier systems are in Manila and Singapore, the company further stated.

The Singapore installation is a "Conduit Weathermaster System," in an eight-story building. Designed for individual temperature control in each room, this system is the first of its kind ever installed in the Far East, according to the manufacturer.

## ROOMS AVAILABLE

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**NOVEMBER 17**

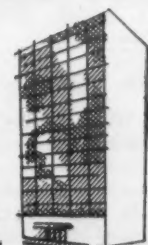
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## Refrigeration Problems

### And Their Solution

(As Written by Paul Reed)

#### Pressure Drop (2)

The purpose of the expansion valve, float valve, or capillary tube is to produce pressure-drop. Almost everywhere else in the system, pressure-drop is not wanted and although it cannot be entirely avoided, it can be kept to a minimum.

In no part of the system is it more important that pressure-drop be kept to a minimum than in the evaporator and in the suction line, and yet there is probably no part of the system in which excessive pressure-drop is more common, but unrecognized in many installations.

#### NO PRESSURE-DROP IN IDEAL EVAPORATOR

Ideally, there should be no pressure-drop from the inlet of the evaporator, through the evaporator, through the suction line, and back to the compressor itself. Every pound, or even every one-half pound per square inch of pressure-drop through the evaporator and the suction line means a loss in the capacity and efficiency of the system.

In passing through the expansion valve, the pressure of the liquid refrigerant is reduced from that of the high pressure side of the system (approximately the head pressure) to evaporator pressure. It immediately starts to boil and change to a saturated vapor, and it continues to do this until somewhere toward the outlet end of the evaporator, the liquid has all boiled away and only vapor is left.

From there on, the vapor ceases to be saturated and becomes a superheated vapor. We call this liquidless vapor superheated, for it is heated to a temperature above that of the boiling liquid and of the saturated vapor.

#### AN ACTIVE EVAPORATOR

Most of the evaporator is at the same temperature, the saturation temperature corresponding to the pressure. This is what we call the "active" part of the evaporator, for it is the part in which the real refrigeration is going on. There, the heat is absorbed into the refrigerant in changing from a liquid to a saturated vapor.

There is very little refrigeration done in that small part of the evaporator toward the outlet end where there is no liquid and where the vapor is being superheated. The only heat absorbed in this superheated part is that taken up by the vapor in superheating or warming up, and that heat is very small compared to the heat absorbed in the active part of the refrigerant.

If there were no pressure-drop whatever through the evaporator, the pressure throughout the evaporator would be the same, so the temperature throughout the active part of the evaporator would also be the same.

However, the temperature of the vapor would rise from the end of the active part (where it runs out of liquid) as the vapor superheats but the pressure would still stay the same as that of the active part.

Let us assume that the expansion valve is the thermostatic type, with, as shown in Fig. 1, the bulb attached to the outlet end of the evaporator. The thermostatic expansion valve (abbreviated TEV) is designed and adjusted to maintain a 10° superheat.

This means that regardless of the temperature of the active part of the evaporator, the TEV lets just enough refrigerant into the

evaporator that almost all of the evaporator will be active, but always leaving just enough of the evaporator for the vapor to superheat or warm up just 10°.

In this manner, the outlet end of the evaporator, where the bulb of the TEV is attached, is always just 10° warmer than the active part of the evaporator.

For example, we want to maintain the active part of the evaporator at 15° F., so the pressure throughout the active part is 17.7 p.s.i.g. Since we are assuming that there is no pressure-drop throughout this evaporator, the pressure throughout the superheat part of the evaporator is also 17.7 p.s.i.g.

However, the outlet end of the evaporator is 25° F., for the superheat is 10°, so 15 + 10 equals

25° F. The bulb is attached at the outlet end, so the bulb is also at 25° F.

As is commonly true, the power element of this TEV is charged with the same refrigerant as is used in the system. Then with the bulb at 25° F., the pressure in the power element will be 24.6 p.s.i.g., corresponding to 25° F.

The pressure in the power element of a TEV tends to open the valve; the pressure at the inlet of the evaporator tends to close the valve. But the evaporator pressure is only 17.7 p.s.i.g. and that in the power element is 24.6 p.s.i.g., which, being 6.9 p.s.i. greater than the 17.7 p.s.i.g. pressure in the evaporator, would hold the valve open. In order to balance the two pressures, the valve would have to have a 6.9 pound spring to help the 17.7 evaporator.

If the bulb warms up a little, the pressure in the power element increases. This throws the TEV out of balance, and the pressure in the power element becomes greater than the combined pressure of the evaporator plus its spring, so the valve opens a little and lets more

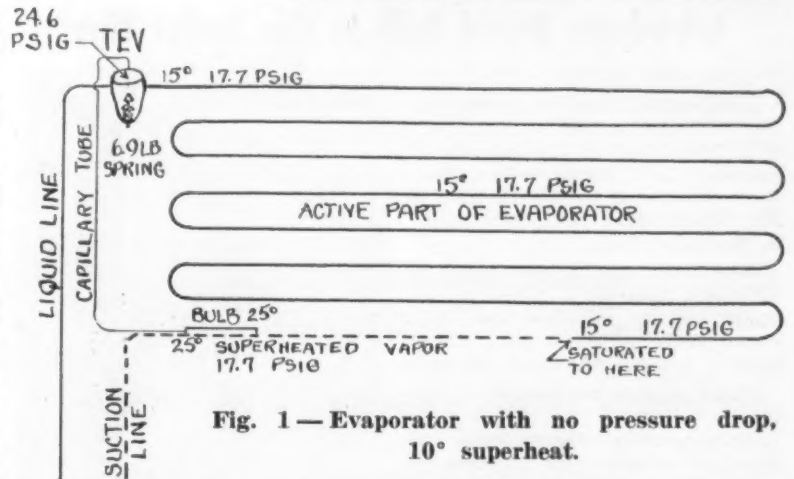


Fig. 1 — Evaporator with no pressure drop, 10° superheat.

liquid through.

This feeds a little more of the evaporator and thus cools more of the evaporator (increases the active part). This raises the evaporator pressure and cools the bulb.

Both of these actions tend to close the valve, and restore the superheat of 10° F. The small amount of evaporator devoted to superheating is kept the same size,

which in turn automatically leaves the rest of the evaporator for the active part the same. In this way, by maintaining a constant superheat, we kept the evaporator fully active at all times, except for the small superheat part.

Bear in mind that this would be true only if there were no pressure-drop in the evaporator.

(To Be Continued)

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## What's New

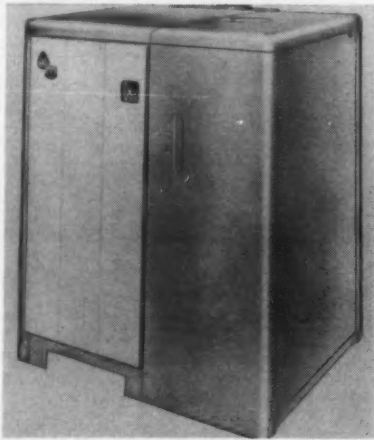
### Introduces Broad Built-In Gas Boiler Line

—KEY NO. G-1110—

JOHNSTOWN, Pa. — Introduction of a broad line of gas boilers with versatility as the keynote of the new "16C" series boilers, have been announced by the Heating & Air Conditioning Div., National-U. S. Radiator Corp.

New units span a wide range of sizes and capacities. Domestic hot water can be supplied the year-round from a large selection of built-in heaters, the company said.

Three nipples are used to maintain a steady water line, and to provide positive internal water circulation between all sections, it was pointed out.



### Steam Coil Maintains Uniform Temperature

—KEY NO. G-1111—

ST. LOUIS — A completely new type of steam coil which maintains uniform surface temperatures over the entire face area regardless of fluctuating load demands has been

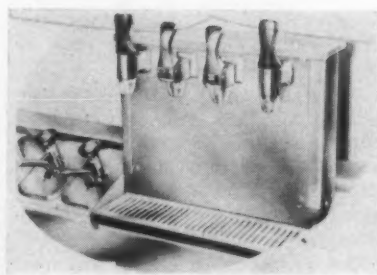
developed by Marlo Coil Co. here. Known as the "Evtntemp," the coil provides uniform leaving air temperatures free of all stratification, with the consistency necessary for precise control.

**WIN A PRIZE!** Send your cartoon suggestions on the subject of "Genetron" Super-Dry Refrigerants to: "Genetron" Dept., General Chemical Division, Allied Chemical & Dye Corporation, 40 Rector Street, New York 6, N. Y. WE WILL PAY \$10 for every cartoon idea used and print your name and address.

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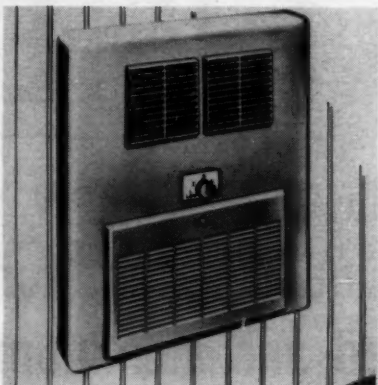
### Tap Touch Provides Instantaneous Stream

—KEY NO. G-1112—

BROOKLYN — Dunhill "Cold-A-Mix" fountain fixtures are claimed to provide instantaneous streams of clear sparkling carbonated water and ready-mixed carbonated beverages at the touch of a tap. Cold-A-Mix units are made for immediate installation on all existing Dunhill soda fountains.

Special feature of the new unit is the fully-refrigerated stainless steel panel which keeps carbonated beverages ice cold to the very moment they are drawn into a glass. Cold-A-Mix completely ends the problem of a warm first drink, it was stated.

Designed to reduce beverage costs and provide faster service in busy luncheonettes, restaurants, drugstores, and soda fountains, Cold-A-Mix fixtures are available in banks of three, four, and five dispensing taps.



### Hydronic Cooling Unit Announced

—KEY NO. G-1113—

JOHNSTOWN, Pa. — A new hydronic air conditioning and heating unit has been announced by National-U. S. Radiator Corp.'s Heating & Air Conditioning Div.

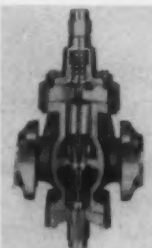
Designed to custom tailor indoor weather to each room of a home or small building, the unit through innovations, is reported to operate at considerably higher levels of over-all efficiency.

"Capitolaire VRS" fan-coil unit fits almost flush with the wall, and all outlet connections are concealed. The unit is designed to fit snugly between studs located on 16-in. centers.

### Adds Back Pressure Regulator Line

—KEY NO. G-1114—

CHICAGO — A new 2½-in. port size series of back pressure regulators announced by Refrigerating Specialties Co. includes the following features: Modulating V-port seat provides precision evaporator control and eliminates chatter under light loads; compactness; simplicity of parts.



Suited for close regulation of chillers, flooded or direct expansion evaporators, or for hot-gas defrosting pressure control, this regulator is available with optional features such as electrically compensated, pneumatically compensated, holdback, dual, and electric stop.

Air Conditioning & Refrigeration News, November 4, 1957

### 6-Model Range Line Features 'Top Bake' Heat

—KEY NO. G-1115—

DETROIT — Kelvinator Div., American Motors Corp. has announced a new, six model electric range line for 1958 featuring finger-wide pushbutton controls and "top bake" oven heat which uses broil unit in combination with baking element for heat distribution.

Range line includes three 40-in. models and three 30-in. units. All new models have divided cooking tops with pushbutton controls for three surface units.

For ease of cleaning, the "off" button has been designed to return to a position parallel with the other buttons. When range is not in use, all six buttons are in the same plane so that a single wipe of the cloth cleans their surfaces.

"Superspeed" surface unit indicates most frequently used settings on the rotary switch, but permits



infinite number of settings to meet all cooking needs. New "top bake" oven heat provides baking by cycling broil element on and off to furnish even heat distribution. Easy-to-set automatic oven timer control requires only two simple settings — "cooking hours" and "stop time." This automatic control starts the oven, times the meal, and turns heat off when food is ready to serve. Rod-type bake and broil units are self-cleaning.

### Claim Advantages for Air-Handling Unit



—KEY NO. G-1116—

CHICAGO — Advantages in performance, appearance, and installation are claimed for the new compact air-handling unit for commercial installation of "Rheem-

aire" central air conditioning, according to the Home Products Div. of Rheem Mfg. Co.

The unit, which weighs 150 lbs., can be installed by two men, even when plans call for installation of the air handler on the ceiling of the store, restaurant, or other commercial establishment, the company said.

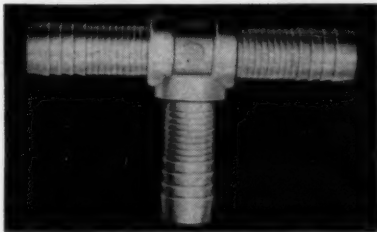
Models of the Rheemaire air handlers deliver 40,000 and 57,000 B.t.u.h. of cooling and are designed for operation with the regular new standard condensing units.

### Has Nylon Fittings for Use with Plastic Pipe

—KEY NO. G-1117—

FRANKLIN, Pa. — Precision-made "Dur-X" nylon fittings for use with plastic pipe have been developed by Franklin Plastics, Inc.

Made of top-quality nylon resin, these fittings will not corrode or rust. During manufacturing they are subjected to toughening.



### Develops Scented Safety Cleaning Solvent

—KEY NO. G-1118—

CRANFORD, N. J. — A new, scented, safety cleaning solvent for wipe or dip cleaning of greasy and

oily machine parts and electrical equipment has been developed by Harco Chemical Co. here, it has been announced.

## Information Center

For more information on What's New products, current literature and catalogs available, equipment advertised in AIR CONDITIONING & REFRIGERATION NEWS use Key Numbers where designated or specify products advertised and we'll see that you receive this information promptly.

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## DESICCANTS AND DRIERS

### Part 7—The Drier In The Line

By Frank Versagi

In their eagerness to remove everything from a system, manufacturers have sometimes made the mistake of designing to filter out even the finest particles. Actually, however, the very smallest of particles can recirculate repeatedly without doing harm to a unit, but will cause a flow restriction when they are trapped and gathered on a superfine filter.

At the other extreme, especially with some of the formed desiccants, the drier is designed in such a manner that a significant portion of the refrigerant can flow through without passing through anything other than a large-opening screen.

For effective, but not excessive filtering, there is a mini-

mum total filtering area for each size drier. This total area may be obtained by use of inlet and outlet screens or pads, by internal filter screens, and by the filtering effect of the desiccant itself. Generally speaking, a drier with a granular desiccant like silica gel will require more mechanical filtration than one with a cored or briquetted desiccant.

This is because the refrigerant flowing through a loose granular desiccant is not brought into contact with as much surface area as when it is flowing through a well designed briquette. For this reason, too, it would be unnecessary to use mechanical filters, like screens and pads, as effective as those which must be used with a granular desiccant.

A well designed drier, charged with a granular desiccant and built with adequate filters, will have a pressure drop of less than 1 lb. when applied to a unit for which it is rated. A briquetted desiccant, mounted with less effective mechanical filters, will function in about the same range. It is the total effective filtering area which determines pressure drop and filtering efficiency.

For this reason, there may be some question that smaller driers making use of newer, more effective desiccants, will serve the clean-up purpose that a drier should, even though they may do a wonderful job on moisture removal.

The normal test for pressure drop on driers is for comparison only, for its conditions are not realistic as far as practical uses are concerned. For example, a 1-hp. drier on a 1-ton unit will show less than 1 lb. of pressure drop. The rating calls for determining how much refrigerant will flow through the drier when the pressure drop across it is 2 lbs.

This drier would pass 30 lbs. of refrigerant per minute before reaching a 2-lb. pressure drop. But this is equivalent to a 7.5-ton unit, and such a drier would never be used on a 7.5-ton unit.

In effect, this means that

most good driers have extra flow capacity—well beyond what will ever be needed.

But the general idea of speaking of driers in terms of horsepower and tonnage is being revised for a more scientific method of measurement.

After all, a 1-ton or 1-hp. unit with a 60° F. coil would give better than a ton of refrigeration, while the same unit with a -40° F. coil would give about 1/4 ton of refrigeration. Thus a 1-hp. motor can be used on a 1-ton unit or on a 1/4-ton unit depending on the evaporator requirements.

The old method of rating driers for moisture removal called for 12 cu. in. of desiccant for each horsepower or ton. Such a rating led to many driers being considerably larger than they had to be since it did not take into consideration the actual difference in adsorption capacity of the various materials.

#### New Rating Method

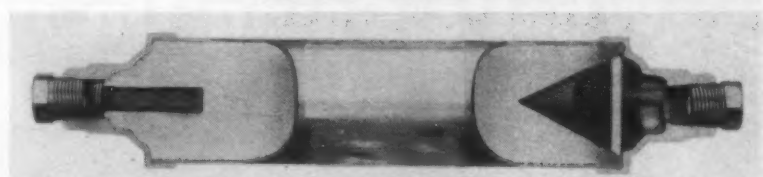
The new method recently adopted by ASRE makes use of the amount of moisture the drier is expected to pick up per pound of refrigerant and still keep the moisture level down to safe levels.

To meet the standard, a drier must be able to pick up 550 p.p.m. from a pound of Refrigerant-12 and still hold the level of moisture in the refrigerant to a safe 15 p.p.m. The drier must hold 990 p.p.m. and hold the refrigerant to 60 p.p.m. when Refrigerant-22 is used.

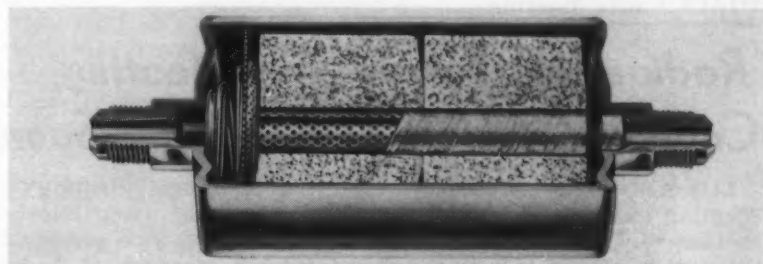
In easier terms, the ratings are based on the drops of water which must be adsorbed at two temperatures—75° and 125°. One drop is about 110 parts per million.

Knowing the various desiccants available; knowing their strong and weak points; taking into consideration just how much clean-up power is desired, the serviceman can pick the drier most suited for his needs. It is unlikely that any one drier will ever be built so perfectly that it will perform every function.

If we are realistic, we must admit that some of the most popular driers on the market today are excellent filters but only fair, and sometimes poor moisture removers. On the other hand, some of the most effective moisture removers are poorly



TYPICAL drier assembly showing loose desiccant and mechanical filters at inlet and outlet.



BRIQUETTED desiccant makes a good filter. It is not necessary to have extensive mechanical end filters in the drier.

designed from the standpoint of over-all clean-up of the unit. A few driers have a good balance between moisture pickup and filtration, not sacrificing one for the other. As might be expected, such driers cost more than the unbalanced driers we have mentioned.

The serviceman must use his judgment. If he is drying out a unit which has become exceptionally wet, by installing one drier after another, he should pick up the drier with the most effective desiccant. In this case, filtering ability is certainly secondary, especially when we consider the fact that the desiccant itself will act as a moderate filter. On big jobs, the use of refillable cartridges takes this point into consideration.

If a compressor has just been overhauled and there are sure to be physical impurities like metal filings, dirt, grit, and lint in the lines, then a good filtering unit is called for and moisture removing ability is not so important.

#### Study Engineering Details of Drier

The appearance of a drier may have some art value, but the value of a drier is entirely dependent on how it is built internally. It would pay the serviceman to spend an hour or two going over the engineering information supplied by most drier manufacturers, so that he may see just where each of the various styles and designs will serve him best.

For, although there is no one best drier for all applications,

there definitely is a best drier for each individual job. Both money and time can be saved by learning to determine which drier that is.

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"Another factor was the healthy growth trend evidenced in this community. We were also impressed by the excellent living conditions which seemed important in maintaining maximum worker efficiency. Actually it was the combination of many advantages which influenced us in making this choice."

If you are studying western industrial sites, contact the American Radiator & Standard Sanitary Corporation — or any other firm in this area. Each one will gladly give you straight answers.

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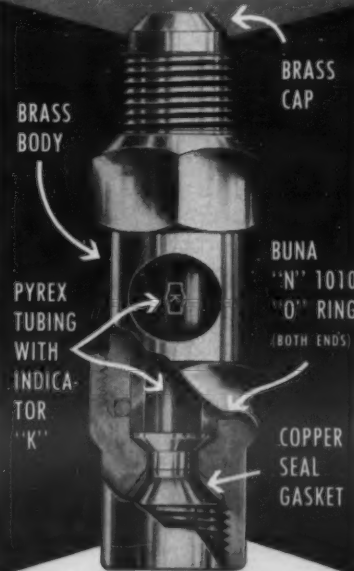
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News of Methods, Products, People

## IHACI Calif. Meeting

### 'Radiant vs. Forced Air' Heating, Cooling Comfort Debate Due Soon

LOS ANGELES—A debate on "heating and cooling comfort—radiant vs. forced air" features the next regular dinner meeting of the Institute of Heating & Air Conditioning Industries at Carolina Pines, Hollywood, Thursday, Nov. 14.

Institute speakers will be Don

Will of Southland Heating & Air Conditioning, Long Beach; James F. Deane, vice president and general manager of Tuck-Aire Furnace Co., San Francisco; and Art Horn, national sales manager of Day & Night Mfg. Co., La Puente.

Speaking for Radiant Heating & Cooling Institute of Southern California will be Tom Parry, mechanical engineer of Pasadena; L. C. Bishop of Year-round Comfort, Inc., Los Angeles; and A. Quincy Jones of Jones & Emmons, architect, West Los Angeles.

Moderator will be Harold P. Hayes, dean of the Engineering Div., California State Polytechnic college, San Luis Obispo.

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- 10) **Builder Called 'Prime Medium' In Home Conditioning Sales**
- 11) **How To Increase Merchandising Appeal**
- 12) **What Happened To Residential Air Conditioning In 1956**
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## Dealers To Tell How They Solved Specific Problems at NWAHACA Chicago Meeting Nov. 21

CLEVELAND—Case histories of specific dealer problems with dealers on the platform to tell how they solved them will highlight the 44th annual convention of the National Warm Air Heating & Air Conditioning Association.

The convention will be staged in the Terrace Casino of the Morrison hotel, Chicago on Thursday and Friday, Nov. 21 and 22.

### 'TEAM-MATES' ON PLATFORM TOO

As team-mates to the dealer speakers, wholesaler and manufacturer representatives who have worked closely with these dealers in solving the problems described, will be on the platform with them and will participate in the discussion.

"Our purpose in this new approach," stated George Boedener, managing director of the association, "is to demonstrate to the industry that the dealer's problems are not his alone but the problems of the entire industry. Dealer problems are wholesaler and manufacturer problems as well.

"We believe that in this con-

vention program we will be able to tangibly demonstrate that all industry problems can be more successfully solved through a closer working together by all segments of the industry.

Convention program, as far as completed to date, follows:

#### THURSDAY, NOV. 21

8:30 a.m.—Registration, Lobby Terrace Casino.

9:45 a.m.—Morning session, Terrace Casino.

Invocation, Dr. Charles Ray Goff, Methodist City Temple, Chicago.

"Let's Work Together," F. L. Meyer, president, The Meyer Furnace Co., president, National Warm Air Heating & Air Conditioning Association.

"It's Your Market," E. C. Carter, publisher, Snips magazine; John R. Reock, sales promotion manager, American Artisan magazine; E. A. Scott, Jr., editor, Heating & Air Conditioning Contractors.

"Group Advertising Is Profitable," Walter Marth, G. F. Marth & Son, Milwaukee; F. E. Mehrings, Heating & Air Conditioning Supply Co., Peoria, Ill.; J. F. Deane, Tuck-Aire Furnace Co., San Francisco.

"The Terre Haute Story," Walter Stevenson, Hoosier Heating & Sheet Metal, Inc., Terre Haute, Ind.; F. J. Nunlist, executive vice president, Mueller Climatrol, Div. of Worthington Corp.

12:30 p.m.—Luncheon, Constitution Room.

Guest Speaker, Senator Frank J. Lausche, Democrat, Ohio.

2:30 p.m.—Afternoon Session, Terrace Casino.

"Quality Systems Can Be Sold," C. C. Owen, assistant sales manager, Janitrol Heating & Air Conditioning Div., Surface Combustion Corp.; George E. Adema, N. M. Adema & Sons, Buffalo; Marvin L. Phillips, president, Jenny Service Co., Inc., Dayton.

"Give Them Time," Dean Dewitt, credit manager, Lennox Industries, Inc., Marshalltown, Iowa; Clarence G. Guenther, president, Air Way Heating Co., Denver.

"Adding for Added Profits," Fred E. Weldon, general sales manager, General Controls Co.; Dealer speaker to be announced.

"There's Profit In Engineering," J. P. Montonye, Indoor Comfort Conference, Ypsilanti, Mich.; Don Winegardner, sales manager, The Majestic Co., Inc.

Nomination and election of officers and members to the board of trustees. 6 p.m.—Cocktail Party.

#### FRIDAY, NOV. 22

8:30 a.m.—Registration, Lobby Terrace Casino.

9:30 a.m.—Morning Session, Terrace Casino.

"Standardize Your Jobs for Profit," J. S. McDonald, vice president and sales manager, The Excelsior Steel Furnace Co., Chicago.

"Profit Through Better Buying Habits," W. E. Favret, sales manager, The Favret Co., Columbus, Ohio; A. J. Pataky, Adams, Lusch & Schill Furnace Co., Columbus, Ohio; N. T. Hess, Vorys Bros., Inc., Columbus, Ohio.

"Capitalize for Larger Profits," E. H. Roberts, E. H. Roberts Co., Elyria, Ohio; J. A. Reichert, The Decker-Reichert Steel Co., Cleveland.

"Use Your Association for Added Profits." Speakers to be announced. Adjournment.

## 'Know All Your Costs of Doing Business' To Highlight NHAW's Three Workshop Panels In Chicago Nov. 18-20

COLUMBUS, Ohio — Three workshop panels accompanied by dramatic skits, a business conference program, and a demonstration on how to sell to the big dealer in competition with the direct-selling manufacturer are scheduled for the three-day 11th annual fall convention of the National Heating & Airconditioning Wholesalers, Inc.

The convention will be held in the Morrison hotel, Chicago, Nov. 18-20. On Nov. 17 the board of trustees will meet for luncheon.

### DRAMATIC SKIT

After a round of committee meetings on Monday morning, the convention will be opened by an inspirational luncheon speaker yet to be announced. Then conventioners will see a skit dramatizing the difference between the wholesaler who knows his costs and one who doesn't.

Following the skit, a panel of experts will work the theme "Know All Your Costs of Doing Business." The audience will have an opportunity to participate.

On Tuesday, association members will gather for breakfast at 8 a.m. in the Constitution room and then go into a business meeting. At 11:30 a.m., the meeting will break up to give members an opportunity to visit an estimated 50 conference booths in the hotel's exhibit hall

where they will talk business with top executives of their manufacturing suppliers.

A buffet luncheon will be served there and conferences will continue to 5 p.m. Cocktail party by associate (manufacturer) members at 6:30 p.m. and annual banquet at 7:30 are planned for evening.

### HOW CREDIT INFO IS GATHERED

A dramatic skit depicting how credit information is gathered or accepted in some organizations will be followed by a workshop panel on credits, collection, and finance on Wednesday morning.

Later in the morning, a workshop panel on wholesaler budgets for sales promotion is scheduled, also in the Cotillion room.

Chairman of the board of the National Sales Executives Club is expected to speak at the luncheon. After lunch, a NHAW member will demonstrate how to sell the big dealer in competition with the direct selling manufacturer. On that note the convention will adjourn.

For the first time, the NHAW will have a booth at the 10th Exposition of the Refrigeration and Air Conditioning Industry, W. R. Bull, executive director of the association, noted.

## Small-Pipe Warm Air Perimeter Heating Results Report Published by Illinois U

URBANA, Ill.—A full report on the results of research investigation of "small-pipe" warm air perimeter heating systems has been published in "Bulletin No. 445—Performance of Small-Pipe Warm-Air Perimeter Heating System" by the University of Illinois.

The report covers the small-pipe perimeter heating investigations for 1951 through 1954, which was done in the Warm Air Research Residence No. 2 of the National Warm Air Heating & Air Conditioning Association on the campus of the University of Illinois. The National Warm Air Heating & Air Con-

ditioning Association has sponsored a continuous research program at the University for the past 38 years, it was pointed out.

In addition to discussing the performance of warm air perimeter heating systems with and without the addition of heat to the basement, this report contains a comparison of perimeter and high side wall convection systems.

Bulletin No. 445 may be obtained by writing to the University Engineering Experiment Station, University of Illinois, Urbana, Ill. Price is \$1 for each copy.



## Winter Air Conditioning Fundamentals

### Increasing Winter Comfort with 'Comfort Air Circulation'

By H. C. Gurney, Janitrol Div., Surface Combustion Corp.

With just a few simple adjustments and without expensive controls, it's possible to adjust almost any forced warm air system to give homeowners a much higher standard of comfort. In cases where these adjustments have been made properly, the acceptance has been overwhelming.

The disappearance of that disturbing chilled sensation usually experienced just before the furnace came on has caused many to put their sweaters away and others to set their temperature control to a lower level.

The reason is more uniform comfort through reduction of temperature variation, from room-to-room and from floor to ceiling; and all this is being made possible by nearly continuous air circulation better known to many by the familiar letters "CAC."

On the other hand, this so called "CAC" certainly shouldn't be considered a "cure all" for the ills which resulted from a poorly installed system.

#### WHY 'CAC'

By continuous circulation of the air through the entire house, in a manner which is imperceptible to the occupants, it is possible to insure a more nearly uniform temperature from room to room, and from floor to ceiling in each of the rooms.

Suppose for example a strong wind is blowing which affects the temperature in a room apart from the thermostat. The burner and fan have been on and satisfactory heating is taking place until the thermostat is satisfied and the burner shuts off as does the fan shortly afterwards. With the air circulation stopped, the temperature in this room drops more rapidly than in the rest of the house without the thermostat being affected and therefore without a call for heat.

On the other hand, if the air was to continue circulating, a mixing process would continue in the return air plenum of the furnace where the return air from the various rooms is collected.

The air after mixing would be delivered at the same temperature to all rooms thereby causing a slower but more uniform temperature drop to take place throughout the house. This temperature would then be checked quickly by the thermostat again calling for heat.

Also, when the air circulation ceases, mixing ceases and the higher temperature air, being lighter, seeks the ceiling and the colder air seeks the floor. This stratification causes occupants below the thermostat level to feel chilled, ("cold 70" so called), before the furnace is again fired by the thermostat.

The effect of "CAC" operation can best be visualized by thinking for the moment of

previous experience with the increase in comfort of most homes during colder outdoor temperatures. During these times the fan is on all or most of the time. This is the largest contributing factor to increased comfort.

An adjustment for "CAC" is merely a means of extending this comfort producing means into the range of milder outdoor temperatures.

#### WHY 100° RISE IS DESIGNATED

For the purposes of "CAC" operation, however, a higher delivery air temperature, thus lower air volume, will extend the continuous operation of the fan into the milder fall and spring weather when it is really needed. It has been found that "100° rise" under lowest outside temperature conditions extends the range of continuous blower operation during milder weather, yet still retains satisfactory air velocities at the registers. These velocities are low enough to prevent any draft problems, and thus make it possible to tolerate lower minimum register air temperatures.

Of course, the reason for designating this air volume by the term "100° rise" instead of by velocity or c.f.m. is because on the job it is easier to measure the temperature rise through the furnace than the velocity or air volume directly. No instruments other than a thermometer are required, and no complicated computations are necessary.

With the B.t.u. input properly adjusted to the space heated, the "100° rise" in the heated air becomes an easily determinable index to proper circulating air volume. Actually, however, the only time the heated air ever reaches this 100° rise is during those short periods of sustained design weather conditions.

#### COST OF OPERATION CONSIDERED

Fortunately, along with the improved comfort gained by extended blower operation, there is also an economy adjustment.

At first it might be thought that longer blower operation

would surely result in a higher power consumption; however, the resulting lowered volume of air and the accompanying decrease in resistance of the system usually more than offsets the cost of the additional length of blower operation. It means moving less air against less resistance and without the high power consumption required for numerous starts.

#### WHEN IS IT POSSIBLE?

Just how mild the weather may be and still maintain "CAC" is dependent upon the lowest delivery air temperature which can be tolerated as well as the inherent characteristics of the heating system.

The lowest tolerable air temperature, of course, depends upon the register location. With registers located such that they will not discharge directly into an occupied area with any perceptible velocity, a recognized minimum register air temperature of 90° F. or even lower has been commonly used.

#### HOW MODERN CONTROLS FACILITATE 'CAC'

An important requirement for CAC is the ability of the furnace to provide a balanced quantity of heat—just enough to offset the heat loss at any outside temperature without noticeable hot or cold blasts.

Such an operation can be approached through the use of Time Modulation Thermostat Controls. With these controls it is now possible to get eight or more burner cycles per hour, and heating impulses of this order give a smoother or more uniform air temperature from the system following the changes in outside temperature.

These heat impulses might be compared to the power impulses in the operation of an automobile engine. Early in the game a four cylinder engine was popular, but with a demand for higher speeds and better acceleration it was necessary to go to six or eight cylinder engines to give a smooth flow of power impulses. The present heating system is being called upon to satisfy similar demands. Smooth heat delivery and quick adjustments to the variable heat demands.

#### CONCLUSIONS

A review of the requirements finds the following necessary:

- A smooth flow of heat at the furnace is required. This is easy to accomplish by a Time Modulation Thermostat which will give burner cycles of the order of eight or more per hour.
- Higher average air deliv-

ery temperatures to extend the continuous blower operation into the milder weather. A 100° rise at design conditions (continuous furnace operation) found best.

c. Considerable attention must be given register type and location to guard against air discharges striking occupants.

d. Unit should be adjusted for proper input to closely balance the design input requirement for maximum comfort in mild weather.

### Bryant Ups Chappell In General Product Sales

INDIANAPOLIS — Appointment of Will J. Chappell to the newly-created position of general product sales manager for Bryant Mfg. Co. has been announced by H. L. Clary, vice president and general sales manager.

Chappell, who has been product sales manager at Bryant's headquarters offices here since August 1956, takes over sales supervision of all gas and oil-fired heating products manufactured by Bryant.

For 26 years Chappell held various sales positions with the Timken Silent Automatic Co.

### Solar Heat Expert To Test Unit In Own 'Lived-In' Lab

DENVER — Dr. George Lof, solar heat expert, will spend next winter in a "lived-in laboratory"—his new \$40,000 "sun furnace" house located in the outskirts of this city.

Said to be the first home of conventional design to depend on the sun for heat, Dr. Lof's nine-room house will be used to develop data and costs and test the operation of the factory-made solar heating unit.

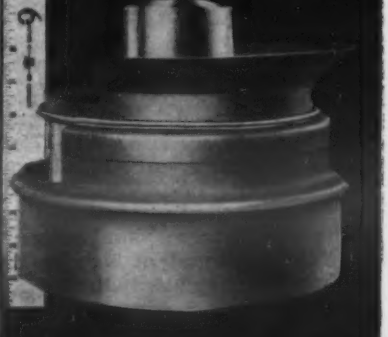
Designed by architect James M. Hunter of Boulder, Colo. to provide 60 to 75% of home heating, the solar furnace will get auxiliary heat from a gas furnace which cuts in automatically during the prolonged cloudy weather and periods of extreme cold.

Dr. Lof, research engineer, designed the solar heating plant for the American Window Glass Co. of Pittsburgh.

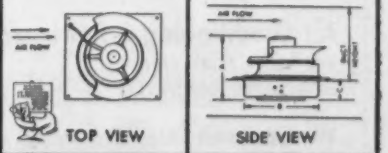
### Honor W. F. Johnson

NEW YORK CITY—Walter F. Johnson, district sales manager of the Newark sales district, Plumbing & Heating Div., American-Standard, was guest of honor at a recent luncheon held to commemorate his 50 years of service with the company.

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## Gibson Offers '58 Conditioners--

(Concluded from Page 1)

matic heat pumps in size and capacity.

Both heat pumps and air conditioners are in cabinets measuring 24 by 30 by 49 in. The 2-hp. unit has a cooling capacity of 21,000 B.t.u. and the 3½ hp. a cooling capacity of 34,000 B.t.u. at ARI standards. The heat pumps also have heating capacities of 21,600 B.t.u. and 34,500 B.t.u. at 35° F. outside temperature.

Retail prices are expected to range from less than \$800 to about \$1,500, according to A. F. Johnson, product manager for central air conditioners.

### 'THERMOMATIC' HAS TWIN REFRIGERATION SYSTEMS

The new Gibson Thermomatic has twin refrigeration systems on the 3½-hp. size to provide almost continuous dehumidification at low operating cost. Both Thermomatic models have two-stage heating and cooling thermostats for completely automatic operation. All models are completely weatherproof for outside installation.

An exclusive inclined evaporator coil design increases dehumidification at all temperature levels because the air contacts a greater coil surface and increases the rate of condensate removal, Johnson said.

Three row (on 2-hp. models) and four-row condensers and evaporators are used for maximum efficiency. The completely balanced system maintains top efficiency through a wide range of operating conditions, he claimed.

Hermetically sealed at the factory, the Gibson units require no plumbing or refrigerant connections in the field. All models are built to meet FHA requirements and can be used with or without prefabricated ductwork,

Johnson declared.

The compactly-designed new line can be suspended from the ceiling, straddle, or flush mounted. Installation in the basement, attic, crawl space, dormer, or outside flat roof is possible, as is attachment to any forced air system.

Thermostats are provided for automatic control, and the refrigeration system carries a five-year warranty. All models operate on 230 volts single phase.

### 11 ROOM UNITS, 5 HEAT PUMPS DUE

Eleven compact new Gibson Trimline room air conditioners and five heat pump models will be marketed in 1958.

Low and thin, the Trimline units are offered in capacities of 1, 1½, and 2 hp. in three series.

The leader model is a new 1-hp. compact unit priced to sell at less than last year's ¾-hp. leader model. It is expected to retail at a price below \$200, according to J. F. Klintworth, manager of air conditioner sales.

Five reverse cycle models are offered as heat pumps, and a new Gibson-developed automatic de-icer control makes possible using this type unit anywhere in the United States.

All models are designed for flush mounting with interior wall.

Top of the line is the "Trimline Supreme" series with Gibson's exclusive automatic "Air-Sweep" feature.

The Air-Sweep device has vertical louvers which oscillate in a 120° arc to direct air gently from wall to wall, providing even air flow without drafts.

Cabinet dimensions are 17 in. high, 26½ in. wide, 17 in. deep. Control panel has attractive sliding door which has a func-

tional role. Closed doors speed dehumidification; open doors create greater cooling by controlling the amount of air that passes over cooling coils. The pushbutton controls operate the Air Sweep mechanism as well as other functions.

These models have two-speed fan, fresh-air intake and stale air exhaust, and automatic thermostat. Greater flexibility in installation (through-the-wall, in casement window, all-the-way inside, half-way in and half-way out) is made possible because there are no louvers on side of cabinet. Models are:

Model 1-6871—1 hp., 7.5 amps., 115 volts.

Model 1-6851—1½ hp., 12 amps., 115 volts.

Model 1-6852—1½ hp., 12 amps., 230 volts.

### REVERSE-CYCLE IS AUTOMATIC OR PUSHBUTTON

Heat pump models with automatic and pushbutton reverse cycle systems are available in the '58 Gibson line. The automatic unit has a special thermostat to switch from cooling to heating or heating to cooling as needed. Automatic de-icer control takes over when condenser becomes inoperable under frost conditions. The automatic heat units will operate satisfactorily in the coldest areas in the United States, and should prove ideal for temporary heating in north or south.

Two models—of 1 and 1½-hp. size—will be available in the automatic heat pump system: Model 1-6852H is 1½ hp., 230 volts, and model 1-5812H is 1 hp., 230 volts. Three models will be equipped with pushbutton reverse cycle systems for southern areas:

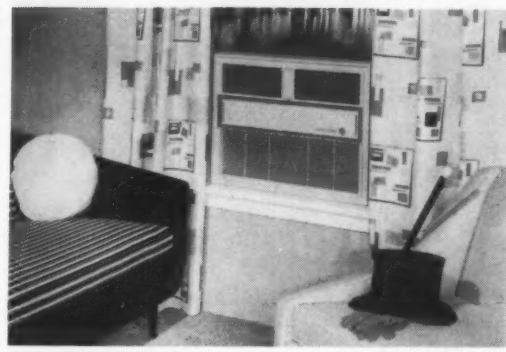
Model 1-5851 R—1½ hp., 115 volts.

Model 1-5852 R—1½ hp., 230 volts.

Model 1-5822 R—2 hp., 230 volts.

The all-new "Deluxe" series is only 23 in. wide, 15 in. high, and 18 in. deep.

Model 1-3802 (1 hp., 230 v.,



AUTOMATIC heat pump is a featured model in the 1958 Gibson room air conditioner line. "Trimline Supreme" model 1-6852H is a 1½-hp., 12-amp., 230-v. unit with special thermostat which will automatically switch from cooling to heating or from heating to cooling. Reverse-cycle unit has automatic de-icer control that permits the model to be used anywhere in the nation.

8 amp.) is a merchandising leader with master control, thermostat, and four-way directional louvers.

Model 1-3812 (1 hp., 230 v., 8 amp.) has two-speed fan, pushbutton controls, and thermostat for automatic cooling.

Model 1-3817 (1 hp., 110 v., 7.5 amp.) uses 40% less current than a standard ¾-hp., 12-amp. unit operating on 110 v. It can be plugged into a clock radio or similar timer for automatic starting and stopping.

Measuring 17 in. high, 23 in. wide, and 24 in. deep, the five models in the 1958 "Trimline Custom" series are brand new. Except for size, they are identical in appearance and features.

### 2 ALL-WAY LOUVERS

On the front of the new '58-design unit are two all-way directional louvers with fixed louver center section to distribute air in an overhead pattern for maximum cooling without cold drafts.

Control panel has pushbutton controls for two-speed cooling or air circulation, and a new infinite control for fresh air intake and stale air exhaust. New thermostat is contained on center dial.

Inside the unit is a blower wheel for circulating air in the room, two-speed fan motor with lubricated-for-life bearings, and large steel slinger ring for condensate removal. All models have a special slide-out chassis for easy installation and service.

The five models and their sizes:

Model 1-5811—1 hp., 12 amp., 115 volts.

Model 1-5812—1 hp., 12 amp., 230 volts.

Model 1-5851—1½ hp., 12 amp., 115 volts.

Model 1-5852—1½ hp., 12 amp., 230 volts.

Model 1-5822—2 hp., 12 amp., 230 volts.

### NO PORTABLE UNIT

The Gibson room air conditioner line will not include a "portable" model in 1958.

"We have tested and rejected several possible models," Conley said. "We prefer that our engineers make further studies of design and efficiency before committing ourselves to marketing this type of product."

"In 1958 we will market a 1-hp. model that weighs only 9 lbs. more than and delivers twice the capacity of some of the so-called portables."

The new dehumidifier features furniture styling and an exclusive device that automatically turns the unit off and flashes a red light when the water container is full. The container holds nearly nine quarts.

The cut-off device is operated by a float in the water container. The water container has a hose connection for direct drainage.

The dehumidifier contains all-copper circular dehumidifying coils with high volume air flow. Large air intake surface makes up the entire rear of the unit.

Under NEMA standard conditions, the unit removes three to four gallons of water from the atmosphere in 24 hours and can take care of 12,000 to 14,000 cu. ft. of space. It operates on 110-volt current and has a ⅙-hp. "Scotch Yoke" compressor.

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## ASRE Schedules 3 Technical Sessions, 4 Conferences, 6 Forums for Nov. 14 Confab

NEW YORK CITY—Assembling for a three-day program of three technical sessions, four conferences, six forums, and numerous committee meetings, the American Society of Refrigerating Engineers will hold its 44th semiannual meeting at the Shoreland hotel, Chicago, Nov. 14-16.

Preceding the convention itself, two days of committee meetings are scheduled.

The program, according to latest information from the Society, follows:

### TUESDAY, NOV. 12

8:30 a.m.—Finance committee breakfast meeting.  
12:30 p.m.—Executive committee luncheon meeting.  
6 p.m.—Regional directors dinner meeting.

### WEDNESDAY, NOV. 13

10 a.m.—Program committee meeting.  
2 p.m.—Constitution and by-laws committee, committee on meeting sites and facilities, standards committee, sections committee meetings.  
5 p.m.—Council dinner meeting.  
8:30 p.m.—Reception.

### THURSDAY, NOV. 14

9:30 a.m.—First Technical Session. "Thermal Conductivity Apparatus for Operation Near Room Temperature"

by T. Gier, R. V. Dunkle, and J. T. Bevans of University of California.

"Removal of Ice Film" by S. G. Eskin of Dole Valve Co., and W. E. Fontaine and O. W. Witzell of Purdue university.

"Influences of Insulation on Moisture-Condensation Aspects of a Steel-Framed Cold Storage Warehouse Structure" by C. F. Kayan and R. G. Gates of Columbia university.

9:30 a.m.—Domestic Refrigerator Engineering Conference.

"Problems of Aluminum Usage in Refrigerator Systems," R. S. Buchanan of Westinghouse Electric Corp. presiding.

Covering: Tube-on-sheet evaporators, roll-forged tube-in-sheet evaporators, fabricating and processing refrigerator components, non-metallic bonding of tube-on-sheet, improvements in materials and processes, and protective coating.

12:45 p.m.—Welcome luncheon. Speaker: Alvin J. Blake, president, Chicago Technical Societies Council.

2:30 p.m.—Second Technical Session. "Greenhouse Climate Control" by R. S. Ash of International Metal Products Co.

"Simple Moisture Indicating Device for Refrigerating Systems" by W. O. Krause and A. B. Gulise of Ansul Chemical Co.

2:30 p.m.—Refrigeration and Meat Packing Conference.

"Refrigeration in Meat Packing and Related Industries," H. A. Stevens of Swift & Co. presiding.

2:30 p.m.—Research committee meeting.

4 p.m.—Admissions committee, international affairs committee meetings.

7 p.m.—Publications committee meeting.

### FRIDAY, NOV. 15

9 a.m.—Air Conditioning Conference. "Central Plant Air Conditioning for Multi-Room Buildings," W. L. McGrath of Carrier Corp. presiding.

9 a.m.—Food Preservation Conference.

"Present and Future Outlooks for Food Preservation," H. C. Diehl, the Refrigeration Research Foundation, presiding.

1:30 p.m.—Forums. Refrigeration in Candy Manufacture. Automatic Operation of Refrigeration Plants in the Meat Industry.

What Can ASRE Do to Interest Industry in Education?

Problems of Correct Installation of Residential Air Conditioning.

Compression Ratio and Discharge Temperature Limits.

1:30 p.m.—Inspection trip to Argonne Laboratories.

2 p.m.—Awards committee, membership committee meetings.

6:30 p.m.—Cocktail party.

7:30 p.m.—Dinner dance.

### SATURDAY, NOV. 16

8:30 a.m.—Membership relations committee, technical coordinating committee meetings.

9 a.m.—Third Technical Session.

"Hermetic Motor Speed Indicator" by W. W. Sutherland, Westinghouse Electric Corp.

"Permeability of Plastics Films to Refrigerant-12 and Nitrogen" by H. M. Parmelee of E. I. du Pont de Nemours & Co., Inc.

"Design Engineering of B-47 Air Cycle Air Conditioning" by G. E. Gregg of Boeing Airplane Co.

12:30 p.m.—Council luncheon meeting.



## Servicing Automobile Air Conditioners

(Vol. 2)

BY C. DALE MERICLE

The Novi unit is the ninth make to be discussed in the current series on automobile air conditioners. Makes previously described in this series were A.R.A., Artic-Kar, Frigette, Frigikar, Kauffman, Mark IV, Airtemp, and Mobilette. Other makes by "independent" manufacturers will be described in future instalments, following which units of most automobile manufacturers themselves will be described.

Models discussed in the current series are 1956 and/or 1957. For data on earlier models readers are referred to the original series of articles, which is available now in the handy manual, *Servicing Automobile Air Conditioners*.

### NOVI (2)

Novi Sales & Service Co., Inc.  
Novi, Mich.

#### Controls

Novi air conditioner controls include multiple-speed switches to control blower operation and a control knob for adjusting the setting of the modulating bypass valve. Systems with a magnetic clutch also have an on-off switch to engage or disengage the clutch from the compressor.

Controls are mounted beneath the dash of the car.

Control panel for trunk models has three push-pull knobs (Fig. 5). Right and left-hand knobs control, respectively, the right and left-hand blowers. These blowers are designed for two-speed operation.

Center knob on the control panel of trunk-type units is connected by a cable to the modulating valve. When pulled to the full-out position, maximum cooling is achieved. The modulating valve is set to limit the evaporator pressure to a minimum of 18 to 20 p.s.i.g. (at 125 p.s.i.g. head pressure) when the knob is in the full-out position, which Novi claims "will cause the minimum of evaporator icing in most parts of the country."

Pushing this control knob in by-passes an increasing amount of refrigerant around the evaporator, thus raising the coil temperature.

Control knob for the modulating valve on under-dash Novi conditioners is attached beneath the dash on the right side of the evaporator case assembly (Fig. 4). It functions in the same manner as the corresponding control on the trunk model.

Fan control knob is attached beneath the dash on the driver's side of the "front-end" Novi conditioner. This control provides three speeds of the single fan motor employed on these models.

Clutch control toggle switch is incorporated in the 1957 model control panels, both trunk and under-dash units. A sepa-

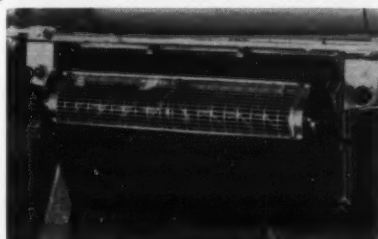


FIG. 4—Novi's under-dash conditioner. Note blower control at left. At right is by-pass valve control and clutch on-off toggle switch.



FIG. 5—Control panel for Novi trunk unit. Center knob controls by-pass valve; outer knobs control blowers.

rate panel for the clutch toggle switch was employed on 1956 models.

### SERVICE HINTS

#### Leak Testing

Before evacuating a system, Novi suggests checking it for leaks.

This is accomplished in the usual manner by first allowing a moderate amount of Refrigerant-12 to enter the system and then checking all joints and lines with a halide torch or an electronic "sniffer."

#### Evacuating System

To permit proper evacuation and drying of a system Novi recommends the use of a vacuum pump.

The system should be pulled down to within 1/2 in. mercury of absolute pressure (depending on altitude) and held there with the room temperature at 70° or above until the system is dry, which usually requires about half an hour.

As an aid in determining whether a system is completely dry following evacuation Novi recommends the use of a moisture indicating unit, which, by changing colors, show the progress in drying the system.

Following the initial evacuation, the vacuum should be broken with Refrigerant-12 vapor, and the evacuating process repeated.

#### Charging System

Novi systems are charged through the low side in the conventional manner with Refrigerant-12.

Exact charge varies somewhat with the model involved. Proper charge, however, is indicated on the nameplate located on the evaporator assembly case.

(To Be Continued)

## PATENTS

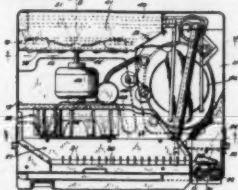
Week of September 17  
(Continued)

**Editor's Note:** Patents described here have been selected from the "Official Gazette" of the United States Patent Office. They offer only a brief summary of each invention. In some instances only the first part of the digest is presented.

Printed copies of patents, reissued patents, and patent designs may be secured from the Patent Office; patents and reissues are 25¢ each, while designs are furnished at 10¢ each. Copies should be ordered by number and title and a mention of the fact if they are either Designs or Reissues.

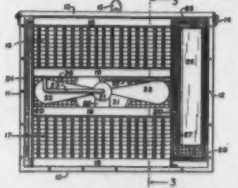
Address orders to: Commissioner of Patents, Washington 25, D. C.

**2,806,361. AIR CONDITIONER.** Arthur E. Kline and Wendell H. Webster, Albion, Mich., assignors, by mesne assignments, to McGraw-Edison Co., a corporation of Delaware.



2. In an air conditioning unit, a housing having two compartments, each provided with inlet and outlet means to permit passage of air therethrough, a refrigeration system including an evaporator mounted in one of said compartments and a condenser mounted in the other compartment, means including an evaporator fan adapted to circulate air in heat exchange relationship with the evaporator and to discharge such air into a room, means including a condenser fan adapted to circulate air in heat exchange relationship with the condenser and to discharge such air outside the room, a third compartment in said housing disposed along one of the outside walls of said housing, said outside housing wall having an opening therein to supply outside air to said third compartment, said third compartment having two additional openings therein, one of said openings leading to said evaporator fan and the other leading to said condenser fan, a three-position valve member, said valve member comprising a door, a pair of oppositely directed substantially U-shaped arms supporting said door, the free ends of said arms hingedly engaging opposite margins of the door and the closed ends of said arms being hinged respectively on opposite sides of the opening leading to said evaporator fan, and means to shift said valve member into any one of said three positions to close off either of said two additional openings or said outside either to recirculate the room air by said evaporator fan without outside air mixed therewith or with outside air mixed therewith or to exhaust the room air to the outside by said condenser fan.

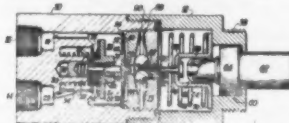
**2,806,362. AIR CONDITIONER.** Marvin E. Calkins, Denver, Colo.



1. An air conditioner comprising a portable housing formed with opposite open ends and a hinged top closure, a closed, unitary fluid circulating system characterized by spacedly superposed radiator members detachably within and substantially obstructing one open end of said housing, a cooling chamber included in said system disposed within the housing at one end of said radiator members, a pump supported by and between said radiator members, flow lines connecting said pump, chamber, and radiator members for circulation of fluid therethrough in reaction to pump operation, a motor within said housing in direct driving relation with said pump, a fan in driven relation with said motor between the latter and said pump, and a compartment adapted to contain re-

frigerants interiorly of said housing separate from, rearwardly adjacent and opening toward said chamber.

**2,806,654. THERMOSTATIC CONTROL DEVICE.** James U. Daly, Latrobe, Pa., assignor to Robertshaw-Fulton Controls Co., Greensburg, Pa.



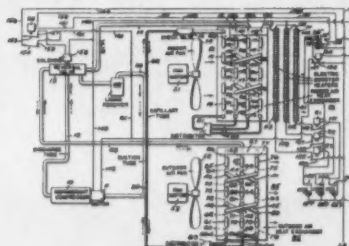
1. In a thrust transmitting device, a first member having a plurality of successively reduced body portions defining a longitudinal axis and movable axially along said longitudinal axis, a second member adapted for axial movement on an axis coaxial with said longitudinal axis of said first member, a plurality of elements having inclined surfaces positioned between said first member and said second member, one of said elements being in operative engagement with said second member, a tapered surface on the periphery of said first member intermediate the ends thereof linking two of said successively reduced body portions, and means operatively associated with said inclined surfaces and said first member to have a wedge effect on said surfaces for causing movement of said second member in response to movement of said first member, said tapered surface engaging said means and imparting movement thereto only during a predetermined range of movement of said first member whereby said first member is capable of movement beyond said predetermined range without imparting movement to said means.

**2,806,655. THERMOSTATIC CONTROL DEVICE.** Charles K. Strobel, Pittsburgh, and Guy F. Conner, Jeanette, Pa., assignors to Robertshaw-Fulton Controls Co., Greensburg, Pa.



2. In a thermostatic control device, the combination comprising a casing having inlet and outlet passages for fluid, a valve seat intermediate said passages, a valve member movable between open and closed positions relative to said seat for controlling fluid flow through said passages, a hollow, elongated thermal element positioned exteriorly of said casing, a rod-like thermal element coaxially mounted within said hollow thermal element, said inner and outer thermal elements having different coefficients of thermal expansion, a sealing and adjustment cap carried on each end of said outer thermal element to selectively vary the length of said outer thermal element, flexible means connecting said casing and said outer thermal element whereby said thermal elements may be placed in a plurality of positions relative to said casing, a flexible member associated with said flexible means and operatively connecting said inner thermal element and said valve member for transmitting movement therebetween, and means cooperable with and substantially coaxial with a portion of said flexible member for keeping said flexible member constantly in tension under all operating conditions of said device.

**2,806,674. HEAT PUMPS.** Gerald L. Biehn, Needham, Mass., assignor to Westinghouse Electric Corp., East Pittsburgh, Pa.



1. A heat pump comprising a compressor, an indoor air coil and an outdoor air coil in a refrigerant circuit with the indoor coil acting as a condenser for heating the indoor air, and the outdoor air coil acting as an evaporator for absorbing heat from the outdoor air, and electric booster heater for aiding said indoor coil in heating the indoor air, indoor thermostatic means for starting said compressor at

a predetermined indoor temperature and for maintaining said compressor in operation while the indoor temperature remains below said predetermined temperature, an outdoor thermostat, and means including said indoor thermostat means and said outdoor thermostat for energizing said heater when the indoor temperature decreases to a predetermined temperature lower than said first mentioned temperature and when the outdoor temperature is at a predetermined level lower than said first and second mentioned temperatures.

(To Be Continued)

### Haveg Industries Acquires Lithgow

WILMINGTON, Del.—Haveg Industries has announced the acquisition of Lithgow Chemical Co. of California, manufacturer and applicator of a wide range of chemical corrosion resistant plastic coatings, cements, impregnations, and laminated linings. The Lithgow organization will be operated as a division of Haveg.

## CLASSIFIED ADVERTISING

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**MAN, AGED 39**, good education, student refrigeration and air conditioning C.T.I. Chicago. Willing to work for low pay for six months to gain practical experience. Prefer Florida or California. Please write soon. JOHN G. ROGERS, 75 Elizabeth Street South, Brampton, Ontario, Canada.

**SALES MANAGER**—Sold for six years. Earned \$8400 year commission. Twelve months' ammonia experience. Bachelor Science sales management from Northwestern. Studied refrigeration for 400 hours at Fort Belvoir. Refrigeration mechanic 14 months in Korea. Draw and type. Available now. Prefer Chicago. \$6500 minimum. Resume available. BOX A5901, Air Conditioning & Refrigeration News.

#### POSITIONS AVAILABLE

**CHIEF ENGINEER** for national manufacturer of commercial air conditioning equipment located in Southwest. Prefer some manufacturing & design experience, but sound application background essential. Write giving full details of your background and experience to BOX A5900, Air Conditioning & Refrigeration News.

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#### MISCELLANEOUS

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## '57 Comfort Cooling Sales--

(Concluded from Page 1, Col. 4) of mechanically refrigerated comfort cooling systems for residences, other than room air conditioners.)

### ABSENCE OF LONG HOT SPELLS HURT

The obvious sales-retarding factors were the absence of any sustained periods of hot weather in the northern metropolitan areas, the decrease in new home building (greater percentage-wise than the decrease in residential system sales), and a confusion in the Federal Housing Administration local offices over comfort cooling standards for FHA mortgage purposes.

### HOME BUILDING 'LIKELY TO IMPROVE'

For a forecast of 1958 residential sales, it's impossible to say how the weather will be (although it couldn't be much worse than in 1957), but it does seem probable that new home building may show some improvement, and the FHA situation is clearing.

Other favorable factors include the growing acceptance of the attic and add-on units, which have opened up the market in existing homes in the \$10,000 and under class, and some improvement in the selling effort—although much is still to be desired in this area.

There are no actual figures available on the relative proportion of sales in new housing and in existing homes (the News' survey in major cities may turn up some trends), but some of the marketing men in individual companies believe that the trend which has tended to put the greater proportion of total sales in existing homes is continuing.

### 3-TON HOME UNIT 'PREPONDERANT'

On the average size of the residential unit, the preponderance of the 3-ton unit may have been even greater in 1957 than in previous years. The ARI statisticians indicate that the equivalent 3-ton unit (ranging from 33,000 to 41,999 B.t.u. capacity) accounts for more than one third of the sales of residential and commercial unit air conditioners.

This obviously points to a preponderance of the 3-hp. unit in the residential field, as there is a greater spread of sizes in the commercial market.

There is general agreement that sales of commercial packaged air conditioners—the tall self-contained units from 3 through 50 tons—probably declined in 1957—some say as much as 15%.

### COMMERCIAL 'UNITARY' INSTALLATIONS HOLD

But there is also considerable evidence, which the ARI statisticians back up, to the effect that other types of unitary equipment, such as the typical add-on system generally designed for residential use, and evaporator coil and blower systems, are going into commercial applications. This, it is estimated, might hold the 1957 figure for commercial "unitary" installations closer to the 95,000 mark of the previous year, than had generally been estimated.

Some encouraging signs for

the commercial market were seen in recent weeks. There was some pick-up in new building and renovation projects. A recent report (see Oct. 28 issue of the News) showed that more new food supermarkets were opened this past September than in any month in 1957, and the openings that month represented the first increase in supermarket openings this year, as compared with comparable months in 1956.

### 'APPLIED SYSTEM' SALES COMPARABLE

Estimated sales volume in "applied air conditioning systems" (all air conditioning other than unitary equipment, and thus including the large installations) is estimated at \$1,190,000, and is thought to be probably comparable to 1956, if not better.

While new construction has

declined, a greater percentage of new construction is being air conditioned.

Room air conditioner sales at retail (as reported in the Sept. 30 issue of the News) were probably close to the 1,500,000 figure mark, but because of a production of 1,850,000 units during the air conditioning year (Sept. 1 to Aug. 31) and an inventory from the previous year of 400,000 units, a carry-over of 750,000 into the new air conditioning year is the generally accepted figure.

### BRIGHT SPOT IN HEAT PUMP SALES

One bright spot in the air conditioning picture was the good sales gains registered by heat pump air conditioners. One estimate puts the 1957 total installations at 12,000 units, by far the best figure in the history of heat pumps. It is thought that about 60% of the total went into residences.

### In Los Angeles

### Advisory Groups To Discuss Heating, Refrigeration Codes

LOS ANGELES—First meeting of the Heating Code Advisory Committee and the Refrigeration Code Advisory Committee will be a joint session on Tuesday, Nov. 5, at 810 S. Flower St. It will start at 1 p.m.

For guidance of members of the committees in their later deliberations, this meeting will discuss administrative provisions of the code only, according to Los Angeles City Dept. of Building and Safety Mechanical Bureau assistant chief Arthur G. Clark, general chairman for both advisory committees.

No code changes will be discussed at the meeting. Clark said the industry will be advised of later meetings for discussion of code revisions.

## York Products--

(Concluded from Page 1, Col. 2) stages of development and will be released for manufacture at the York plant by the fall of 1958. There will be a series of announcements on these products in the near future, he added.

As reported in the Oct. 28 issue of the News, York has successfully concluded negotiations with Lehigh Mfg. Co., Div. of Lehigh, Inc., Easton, Pa., for the purchase of that company's newest automotive air conditioning compressor design and related manufacturing facilities in Lancaster, Pa.

Introduced last June, these Lehigh compressors are being installed in the 1958 models of several leading automobile manufacturers and are being sold as well to most of the independent manufacturers of automotive air conditioning systems, Haase stated.

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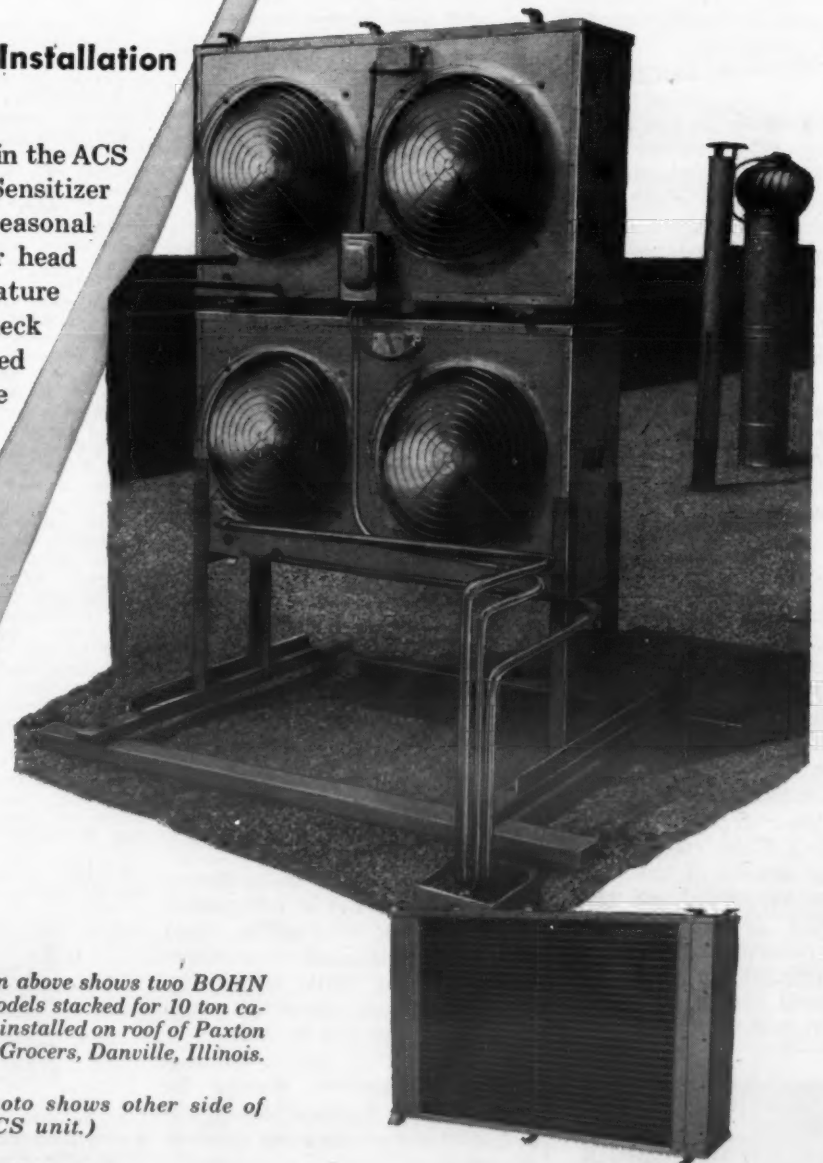


Illustration above shows two BOHN ACS-60 Models stacked for 10 ton capacity and installed on roof of Paxton Wholesale Grocers, Danville, Illinois.

(Small photo shows other side of BOHN ACS unit.)

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